

The Iron Age

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The Engineer as an Economist.

Referring to the above subject Mr. Henry R. Towne, in a paper read at the recent Chicago meeting of the American Society of Mechanical Engineers, remarked that the monogram of our national initials, which is the symbol for our monetary unit, the dollar, is almost as frequently conjoined to the figures of an engineer's calculations as are the symbols indicating feet, minutes, pounds or gallons. The final issue of this work, in probably a majority of cases, resolves itself into a question of dollars and cents, of relative or absolute values. This statement, while true in regard to the work of all engineers, applies particularly to that of the mechanical engineer, for the reason that his functions, more frequently than in the case of others, include the executive duties of organizing and superintending the operations of industrial establishments, and of directing the labor of the artisans whose organized efforts yield the fruit of his work.

To insure the best results, continued Mr. Towne, the organization of productive labor must be directed and controlled by persons having not only good executive ability, and possessing the practical familiarity of a mechanic or engineer with the goods produced and the processes employed, but having also, and equally, a practical knowledge of how to observe, record, analyze and compare essential facts in relation to wages, supplies, expense accounts, and all else that enters into or affects the economy of production and the cost of the product. There are many good mechanical engineers; there are also many good "business men," but the two are rarely combined in one person. But this combination of qualities, together with at least some skill as an accountant, either in one person or more, is essential to the successful management of industrial works, and has its highest effectiveness if united in one person, who is thus qualified to supervise, either personally or through assistants, the operations of all departments of a business, and to subordinate each to the harmonious development of the whole.

Engineering has long been conceded a place as one of the modern arts, and has become a well defined science, with a large and growing literature of its own, and of late years has subdivided itself into numerous and distinct divisions, one of which is that of mechanical engineering. It will probably not be disputed that the matter of shop management is of equal importance with that of engineering, as affecting the successful conduct of most, if not all, of our great industrial establishments, and that the management of works has become a matter of such great and far-reaching importance as perhaps to justify its classification also as one of the modern arts. The one is a well-defined science, with a distinct literature, with numerous journals and with many associations for the interchange of experience; the other is unorganized, is almost without literature, has no organ or medium for the interchange of experience, and is without association or organization of any kind. A vast amount of accumulated experience in the art of workshop management already exists, but there is no record of it available to the world in general, and each old enterprise is managed more or less in its own way, receiving little benefit from the parallel experience of other similar enterprises, and imparting as little of its own to them, while each new enterprise, starting *de novo* and with much labor, and usually at much cost for experience, gradually develops a more or less perfect system of its own, according to the ability of its managers, receiving little benefit or aid from all that may have been done previously by others in precisely the same field of work.

Surely this condition of things is wrong and should be remedied. But the remedy must not be looked for from those who are "business men" or clerks and accountants only; it should come from those whose training and experience have given them an understanding of both sides (viz., the mechanical and the clerical) of the important questions involved. It should originate, therefore, from those who are also engineers, and, for the reasons above indicated, particularly from mechanical engineers. Granting this, why should it not originate from and be promoted by the American Society of Mechanical Engineers?

To consider this proposition more definitely, let us state the work which requires to be done. The questions to be considered, and which need recording and publication as conducing to discussion and the dissemination of useful knowledge in this specialty, group themselves under two principal heads, namely, shop management and shop accounting. A third head may be named which is subordinate to, and partly included in each of these, namely, shop forms and blanks. Under the head of shop management fall the questions of organization, responsibility, reports, systems of contract and piece work, and all that relates to the executive management of works, mills and factories. Under the head of shop accounting fall the questions of time and wages systems, determination of costs, whether by piece or day work, the distribution of the various expense accounts, the ascertainment of profits, methods of bookkeeping, and all that enters into the system of accounts which relates to the manufacturing depart-

ments of a business and to the determination and record of its results.

There already exists an enormous fund of information relating to such matters, based upon actual and most extensive experience. What is now needed is a medium for the interchange of this experience among those whom it interests and concerns. Probably no better way for this exists than that obtaining in other instances, namely, by the

travel. The travel is greater this year than at any preceding time during my recollection."

New Wood-Working Machinery.

We present on this page engravings of two new wood-working machines recently put on the market by the Egan Co., of Cincinnati, Ohio. Fig. 1 represents a blind stile

chine. The foot mechanism is positive, and is so arranged that the boring or mortising of two stiles at once is accomplished. The work being cut from below leaves the mortise clear from chips. The stiles are mortised and bored in pairs, held in position by an ingenious clamping device while being cut. The spindles are then dropped out of the cut. The stiles are released from the clamping, and are fed forward for the next

inches in diameter. The blade tapers, and being very thin at the teeth, the kerf is very light. The feed of the machine consists of four heavily-gearred rolls, with improved gearing, and the frame which carries the four feed rolls is attached to the main frame in such a manner that all four rolls can be adjusted by simply loosening one hand lock nut. The setting and an inclining are done by an adjusting screw, enabling the operator to adjust the rolls accurately to any bevel. The rolls are self-centering—that is, a board 1 inch thick may be followed by another $1\frac{1}{4}$ thick, and both boards split in the center; or one pair of rolls can be made rigid by loosening one hand nut so as to make one side of both boards $\frac{1}{2}$ inch or more. The rolls come within $\frac{1}{2}$ inch of the bed-plate, enabling the operator to split 1 inch strips if necessary. This is a great advantage. The mandrel is of crucible steel and runs in self-oiling boxes, and, with its boxes, can be adjusted so as to accommodate any size saw, and always keep it within the radius of the rolls, so as to prevent any dodging, and compensate for wear on the saw.

The Irregular Distribution of Carbon in Bessemer Steel.

During the discussion at the recent meeting of the Iron and Steel Institute, Mr. E. Windsor Richards, of Bolckow, Vaughn & Co., said he had had a good deal of experience in the last year in making soft steel plates, and he experienced a great deal of difficulty and trouble from two causes, the first being blow-holes; the second, the greatest trouble, was the irregular distribution of carbon in steel. He operated at Eston on large ingots that weighed about 4 tons that were about 6 feet high, 36 inches wide and 16 inches thick. Mr. Stead had very carefully checked their chemical analysis and had found that those ingots varied from 0.10 to 0.15. Their great trouble when steel had to be rolled out into plates—and such an ingot would make several such sized plates—was to keep within the limits required by Lloyd's and the Admiralty, about 4 tons. He tried very many things to get over this very serious difficulty. He tried the mechanical agitator in several forms, suggested by Sir Henry Bessemer, and the poling of the molten metal with a very long pole, as suggested by Sir William Siemens, but that was more comical than effectual. He allowed the metal to rest in the converters for half an hour before they poured. That did not do, and other things they tried without any avail. The matter was very serious. They had a great deal of trouble, and at last they tried that which has been done at other places, but he did not think for the same reason. He dared say that they had all noticed that Mr. Riley, at the Steel Works of Scotland, had one when they were there last year, and that he poured the metal out of one ladle into another, his object not being, he thought, the one he himself was about to describe. Making careful analysis of the ingot he found the steel irregular in the way he had described. He thought after having put the ferromanganese into the ladle he could then turn it over—it was put from one ladle into another—and that he should perhaps be getting rid of the cause and getting a more regular distribution of carbon, and it was the latter which he considered it was most desirable to do. He was glad to say it had been very effective indeed. The steel, which was before very unquiet and restless in the molds, causing a spongy end, giving laminated steel, had now been to a very great extent got over. He would suggest to any of his friends having that difficulty to try the system which he advocated, and which was in operation at his works, and they would find their troubles very much lessened.

Alabama Manganese.—Mr. Alfred F. Brainerd, analytical chemist at Birmingham, Ala., is devoting some study to manganese finds in Alabama, especially with reference to their value for the manufacture of spiegel. He has several specimens, with widely different constituents. The most promising is from near Sheffield, the new town on the Tennessee River. This contains metallic manganese close to 50 per cent. along with 5 per cent. of iron and silicon each. A specimen from near Birmingham is suitable for glass-making and is taken as an indication of a vein near at hand with steel-making properties. It shows 7 percent manganese, 10 percent iron and 35 percent silicon.

A Shovel that Held Millions.—Captain Harry E. Rulon, late of the United States Mint, is said to have in his possession a shovel which for seven years was used for no other purpose than transferring the silver coin of the realm from a drying pan into boxes. By constant use of the implement about $1\frac{1}{2}$ inches was worn from its blade, thus rendering it useless for raising precious metals. During the seven years of its use, according to calculation made by the chief clerk, Captain Rulon handled the almost fabulous sum of \$352,000,000 with that shovel. The Captain purchased it from the Government for 25 cents, and is now using it in his coal bin.

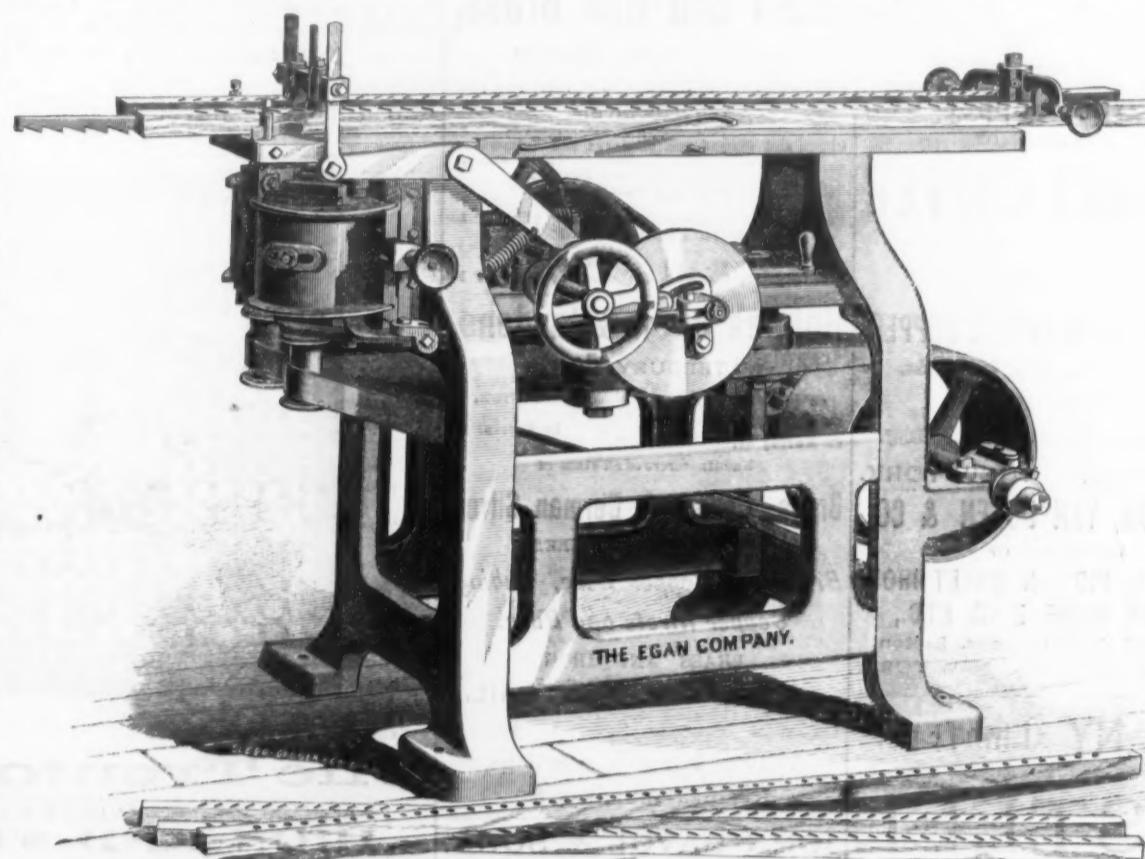


Fig. 1.—Blind-Stile Mortising Machine.

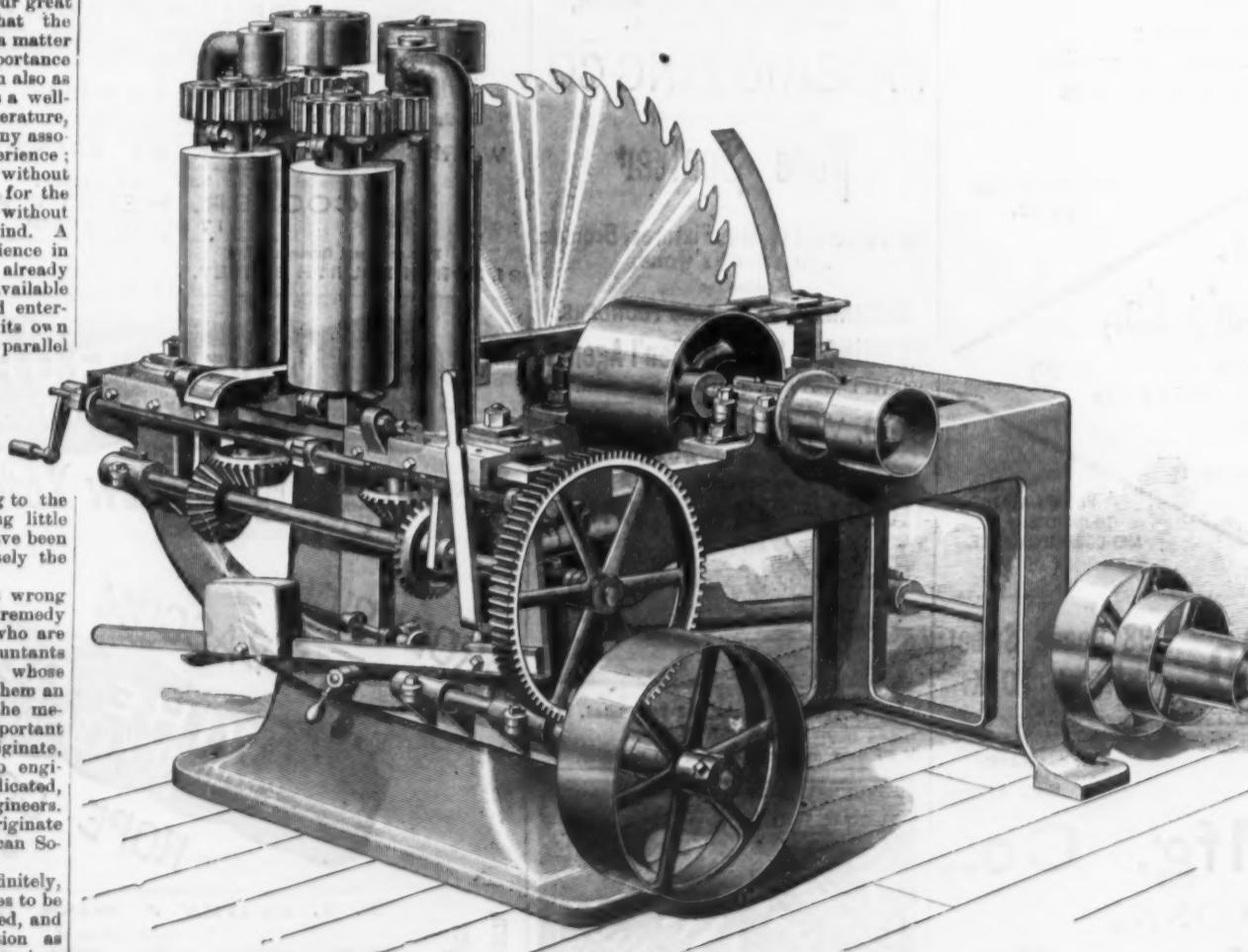


Fig. 2.—Circular Resawing Machine with Taper Saw.

NEW WOOD-WORKING MACHINERY, BUILT BY THE EGAN CO., CINCINNATI, OHIO.

publication of papers and reports, and by meetings for the discussion of papers and interchange of opinions.

A novelty in European travel this season is noticed by the agent of the new French steamer, *Champagne*, who says: "A distinguishing feature of it is that the majority of it is made up of men engaged in some business which has been effected by the strike. To avoid trouble they are taking their families and going to Europe to spend the summer

mortiser and borer, which has been designed to meet the wants of planing-mill managers. In its operations it is automatic and reliable. It is said to be capable of doing a great amount of work and doing it in a first-class manner with less adjustments and less liability to get out of order than other machines which have preceded it. The spindles, which are made of best cast steel, run in a vertical position, connected to horizontal slides. They are operated by a single belt from an ordinary counter-shaft placed on the ma-

chine. The feeding rack is of wrought iron and is placed true, so as to insure perfect work. Mortising may be done at any angle and at any length. Anything from a round hole to one that is $2\frac{1}{2}$ inches in length may be produced. The design and workmanship of this machine are a new departure in many respects. The makers recommend the machine as being a great labor saver.

Fig. 2 shows a circular resawing machine which has just been built by the company. It is designed to take a saw of from 36 to 42

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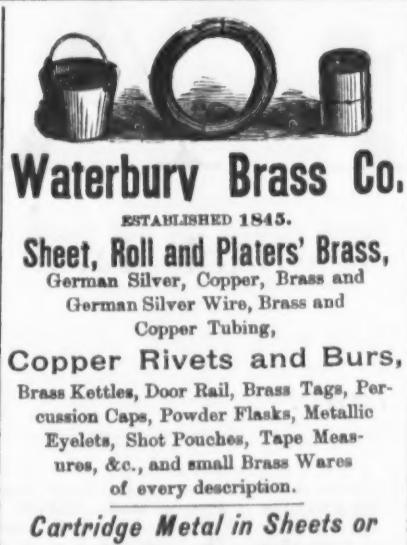
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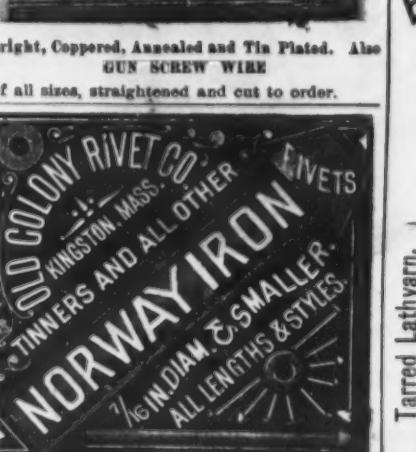
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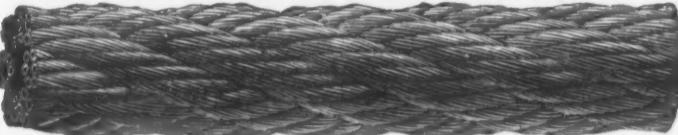
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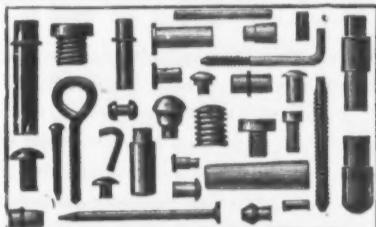


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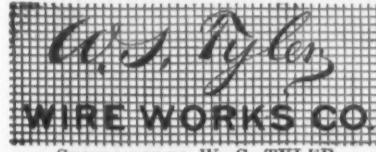
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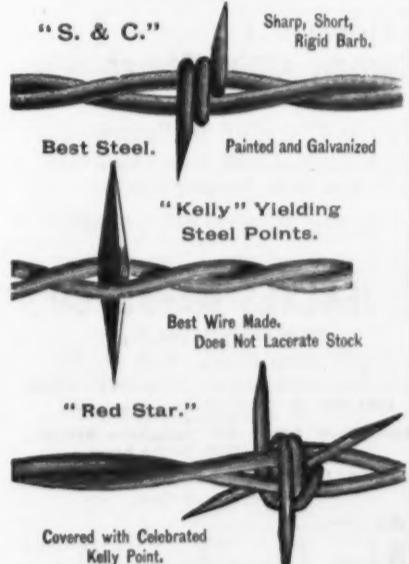
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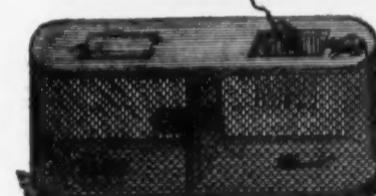
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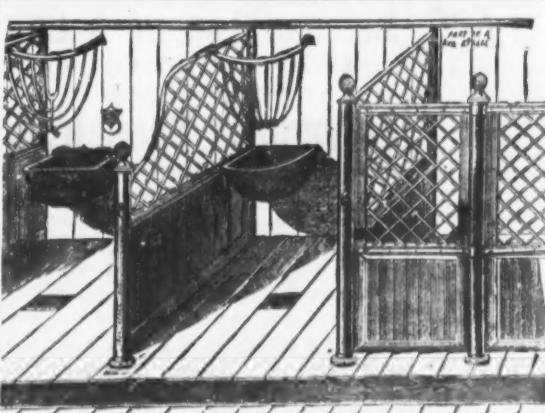
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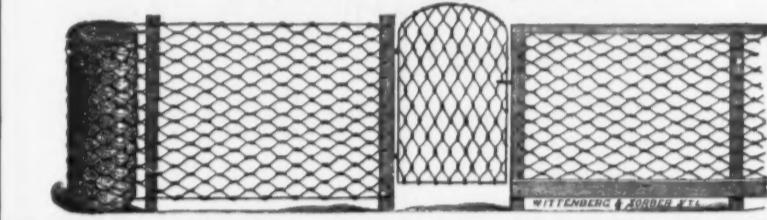
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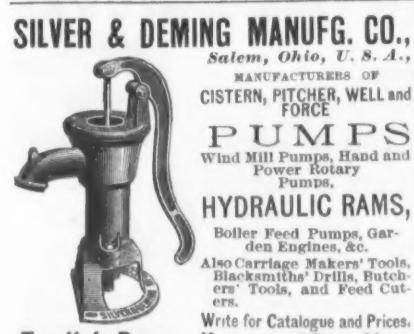
Mr. T. C. Ruggles, C. E., of Yonkers, has addressed the following letter to the secretary of the Union for the Improvement of the Canals of the State of New York:

On the 20th of August, 1885, at Utica, the friends of the Erie Canal of all parties voted "in favor of deepening the Erie to 9 feet," as recommended by ex-State Engineer and Surveyor, Horatio Seymour, Jr., at an expense of \$1,100,000; "also in favor of making longer locks and instructing our Legislature to this effect." But they were opposed to asking any aid of the Federal Government. At Albany this winter some have favored asking the Government for aid, but (April 9, 1886) it was decided at Albany that we would retain control of the Erie Canal. The result when the canal improvement is completed will be an increased amount of Western products through our State. It will increase the value of our land, give more employment to labor and more raw material to our manufacturers and mechanics.

The Empire State has great State pride, and from 1817 to 1836 built and improved the canal from 4 feet deep to 7, and now wants to dig it a little deeper, 2 or 3 feet, making it 9 or 10 feet. Ex-State Engineer Horatio Seymour, Jr., says the Erie Canal, by statement of ex-Auditor J. A. Place (1879), has paid into the State Treasury \$1,903,899 without computing interest; the interest alone on this amount will make this improvement and keep the canal in repair without taxing any one. If the canal goes down or stands still will not all interests suffer? Farmers, mechanics, laborers and manufacturers? Mr. Seymour, in his 1878 report (page 18), giving Mr. Jarvis as authority, says: "It would cost \$22,000,000 to build a railroad on the banks," and then the transportation would not be as cheap as now; railroads charge 4 to 7 mills per ton a mile—the Erie Canal 1½ to 2½. A brief review of our advantages in having this canal should be taken into consideration. No other State has a canal inviting Western products. They have no water for canals and would have too many locks; we have Lake Erie and our inland lakes. Ex-State Engineer Van R. Richmond (September 2, 1879, page 15), thinks it practical to raise the banks 1 foot and lower the bottom 1 foot, making it 9 feet deep, except over culverts and aqueducts. He is confident a full supply of water could be obtained. Ex-State Engineer Horatio Seymour, Jr., says this calamity about water could be prevented.

Alonzo Richmond says (page 15, 1879) the deeper the canal the cheaper the work. He estimates nearly 600 tons cargo, steamer and consort; favors 2 feet deeper—this would make, if the banks are raised, a 10-foot canal. Ex-Governor Seymour, at the Utica Convention, favored deepening the canal to 9 feet. Hon. S. B. Ruggles, at the meeting of the Chamber of Commerce about the Constitutional Amendment, March 10, 1876, favored 9 feet. Mr. Sweet, State engineer, said in his report, 1884, the tonnage on all the canals was 5,009,488 tons, but did not give the tonnage East and West on the Erie Canal. I will estimate the amount carried East and West the same as in 1880. It is larger than other years and is a good example. Auditor J. A. Place, in his report, 1880, gives tonnage East to the Hudson River 3,226,358 tons; West, 1,518,290; total, 4,744,648 tons. The transportation of these tons on the present 7-foot canal Tons
would cost 4,744,648 at \$1.00 = \$4,749,392
On 9 feet this difference
would be 4,744,648 at 0.72 = 3,416,146
The difference in 1880 in favor of 9 feet
would have been = \$1,338,246
On 10 feet this difference would have been = 1,171,925

This would help to divert Western products through the State of New York, and would nearly equal in one year the cost of deepening the canal to 9 or 10 feet. As an example to show the estimated value of transportation on a deeper canal, Mr. Sweet, our present State engineer, said in 1878: "The same boats and same crews without extra cost could have carried 650,000 additional tons to tidewater." Horatio Seymour, Jr., in 1879, speaks of the advantage of increased depth of another foot. He says it was illustrated "in the trip of the Emma and consort between Buffalo and Rochester," where the canal averages 8 feet. One-third better time was made, with one-half the cost, than over a like distance of 7 feet depth of water. We made on the City of Utica, Buffalo to Albion, in 8 feet of water, 4½ miles per hour. Captain Depew, an old experienced canaler, who has charge of a steamer and consort, says that deepening the canal will reduce the cost of a bushel 1½ cents, Buffalo to New York, and secure Western products. Canada is alarmed at the prospect of our deepening the canal (Ontario Legislature, February 25, 1886), and its benefits to our State. They want the St. Lawrence canals, now 9 feet, as deep as the Welland, 13½ feet. We have a great advantage in the amount of paying freight in proportion to weight of canal boats on the Erie Canal. We weighed the canal boats 63 and 61 tons at the weigh locks when sounding the canal for the State, August 5, 1861. The steamer and consort will weigh 130 tons, and carry 580 tons—580-130 = 4 4-10 tons paying freight to 1 ton dead weight. On railroads 1 ton averages 1 ton. One reason the Erie Railroad changed its gauge of 6 feet to 4 feet 8½ inches, the present standard gauge, was that it took 1½ tons dead weight to carry 1 ton paying freight. The Erie Canal will with six men to a steamer and consort carry 580 tons, Buffalo to New York. This is equal to 97 tons to a man. On the ocean it is about 60 tons to a man, but it has better paying freight. This is one reason it carries for less than the canals. When the canal is deeper it will carry better-paying freight. Steam should have preference at the locks, as it once had. With a deeper canal better-paying freight can be carried West, as the boats will make better time. The yearly capacity of the canal with 9 and 10 feet depth will be nearly equal to the railroads in 1884, 22,123,895 tons. The Hon. I. F. Hatch, in the Commercial Advertiser, March



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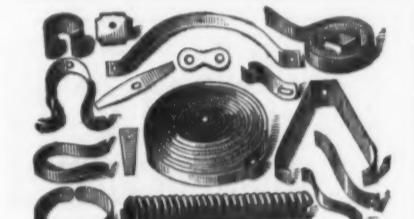
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Pumps, Hydraulic Rams, Garden Engines,

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and Other Hydraulic Machines in the World.

Fig. 120.



Fig. 365.

Fig. 209.



Fig. 70.



"THE AQUANETTE,"

shown in the illustration, is a new article we are introducing, designed for showering trees, shrubs, &c., as an insecticide, intended to carry in the hand, with pail on the arm. It will throw a good stream 40 or 50 feet high.

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We beg to call the attention of Architects, Builders, Dealers, and
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and not liable to get out of order. The Springs are made from
wire, and are properly bent and for this particular purpose, with
the view of great elasticity, durability, and power to produce
a continuance pressure from the point where the door is wide open
until it is closed, and then hold it perfectly in position. It has a
solid pin in connection with short hollow ones, causing little or
no wear in the door, and the door is held in position by a
spring in the door. It is Fast Joint, and can be used for either right
or left hand, allowing the dealer to carry less stock, and the builder
will never get the wrong hand.

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MASTER AND SERVANT.

B. was employed by S. in his factory, and was unexpectedly called from his work to another part of the factory to assist in putting up girders to support a roof in course of construction over the boiler-room. The platform on which he was ordered to go had been used before, and was apparently made of sound lumber, but after the casualty, which caused a serious injury to B., it was found on examination that the broken wood had a knot about 2 inches in diameter near the center, which must have impaired its safety for use as a platform. B. had no opportunity to inspect the platform before going upon it, but he asked the person who had charge of the work, before going up, whether it was safe, and was assured that it was safe. B. sued his employer for damages in negligence—Benzing vs. Steinway—but was defeated on the ground that the apparatus had not been shown to have been supplied by the defendant, but that it was got and used by a fellow-servant of B., for whose negligence S. was not bound. B. carried the judgment to the Court of Appeals of New York, where he succeeded against S. The Chief Judge (Roger), in the opinion, said: "The risks which a servant assumes are those only which occur after the due performance by the employers of those duties which the law enjoins upon him, and he is liable for the negligence of another servant who co-operates with him in producing or rather causing an injury to an employee. The true rule is to hold the master liable for negligence in respect to such acts and duties as he is required to perform, or rather without regard to the rank or title of the agent intrusted with their performance. The rule is unqualified that a master is bound to use all reasonable care, diligence and caution in providing for the safety of those employed by him; safe, sound and suitable tools, implements, appliances and machinery in its prosecution, and to keep them in repair. This duty he cannot escape by delegating its performance to another, or having required work to be done without taking precaution by making due inquiries as to the time and manner of its performance with regard to any danger arising therein. Ignorance of the master of defects in the instrumentalities used by his servants in performing his work is not a defense to an action by an employee who has been injured by them, when by the exercise of proper care and inspection he could have discovered and remedied the defects or avoided the danger incident therefrom. In this case proper inspection would have disclosed the defect which caused the plaintiff's injury, and the defendant must compensate him."

FIXTURES.

A mortgagee of certain personal property claimed it as against the mortgagee of the land. This property consisted of an engine, boiler and certain machinery. The weight of the engine and boiler was 5600 pounds. Two iron legs projected from the rear end of the boiler and stood on timbers. There were also two small projections, one on each side of the boiler, near its front, but that end rested on bricks which were built up to form the ash-box, and laid to prevent fire. A shed was built over the engine and boiler to protect them from the weather. The shed had no opening excepting from the factory, and the engine could not be removed without enlarging this opening or by removing the shed. The boiler and engine were not fastened to the building or to the land, except that it was belted to the main shaft, but its own weight kept it in place. The other machinery was partly nailed and partly screwed to the floor, and some cleats were used. None of these machines were heavy, and they were moved from one part of the factory to the other as they were needed. The master to whom the matter was referred found the property to be personal property, that they were not fixtures, and the case—Carpenter vs. Walker—was carried to the Supreme Judicial Court of Massachusetts, where the master's ruling was sustained. Judge Holmes, in the opinion, said: "Perhaps it would have saved perplexing questions if, as between vendor and purchaser, or mortgagee or mortgagee, the rule of the common law had been more strictly adhered to, that whatever is annexed to the freehold by the owner becomes a part of the realty and passes by a conveyance of it. The right of a tenant to sever chattels which he has attached to the realty might be admitted, and yet the property might be regarded as land until severed, as it seems to be in England. The decisions of this State establish that machinery may remain chattels for all purposes even though physically attached to the freehold by the owner if the mode of attachment indicates that it is merely to steady them for their more convenient use, and not to make them an adjunct of the building or soil. We see no ground to interfere with the finding of the master in this case. This property is not at all necessarily to be considered fixtures."

Hon. Horatio Seymour, Jr., thinks if the canal was deep throughout, as from Buffalo to Rochester, with the same amount of fuel 24 hours could have been saved when he passed through the canal with the Emma and consort. (See his report to the Board of Trade and Transportation, March 23, 1884, page 7.)

1884—By lake, steam
and rail. To Baltimore. To Philadelphia.

Down to N. Y. \$0.74 per ton \$0.58 per ton \$0.49 per ton
New York. 1.5 miles ton 1.07 miles ton 1 mill ton a mile
1 mile. 0.24 cents a bushel. 0.60 cents a bushel. 0.47 cents a bushel. To N. Y.

Up to Buffalo. \$1.53 per ton \$1.10 per ton \$1.00 per ton
Buffalo. 3.1 miles ton a mile. 2.2 miles ton a mile. 2.02 miles ton
4.6 cents a bushel. 3.3 cents a bushel. 3 cents a bushel. To Buffalo.

8 trips capacity a season. 10 trips capacity a season. 12 trips capacity a season.

5,580 tons. 8,300 tons. 10,380 tons.

Hon. Horatio Seymour, Jr., thinks if the canal was deep throughout, as from Buffalo to Rochester, with the same amount of fuel 24 hours could have been saved when he passed through the canal with the Emma and consort. (See his report to the Board of Trade and Transportation, March 23, 1884, page 7.)

1884—By lake, steam
and rail. To Baltimore. To Philadelphia.

10% and 15 cents. 9 cents. 9½ cents.

1884—By lake and
canal. Grain to New York.

8-20 cents and 6½ cents.

Each of the above sums will vary with de-
lays, wages, cost of fuel, repairs, and es-
pecially the management and condition of the
canals.

A number of French cities, desiring to in-
crease their foreign trade, have commenced
to establish permanent free museums, in
which they will exhibit samples of foreign
manufactured goods and raw materials. The
most important of these cities are Lille,
Rouen, Havre, Bordeaux, Marseilles, Nantes
and Paris. These commercial museums will
be maintained by the boards of trade of the
respective cities. The experiment has been
tried with success in Belgium. The French
consul in Chicago, M. H. Verleys, says the
consulate there would ship samples free of
charge to Lille and other cities where these
museums were about to be established. He
wished American merchants and manufac-
turers to send him samples, or, where the
goods are too bulky, their catalogues and
price lists, for exhibition at these museums.
Similar efforts to get samples are being
made by the French consuls at other places.
No branch of trade or manufacture is ex-
cluded.

So deep-seated is the belief that Arizona,
New Mexico and the old Spanish districts in
general are rich in mines long since for-
saken that many persons are hunting for
them, and strange reports of wonderful
riches begin to come back. It is about time
for a new gold and silver wonder to display
itself.

Warm water is now supplied at the rate of
175,000 gallons per day at Pesth, from
an artesian well said to be about 3000 feet
deep and the deepest in the world. The
temperature of the water is 161°, but the
work is to be continued until the tempera-
ture rises to 178°. It is expected that the
supply will also then be ample for all the
wants of the city.

Fire originating from heated asbestos in-
tended as sheathing is noticed by a patrol
inspector in Philadelphia. In one of two
recent instances the combustion chamber of
a regenerative gas lamp was too near cer-
tain woodwork, and asbestos was inserted
between, but the heat soon penetrated the
stratum of asbestos and set fire to the wood.
In the other case the sheet-iron top of a
portable heater was within a few inches of
the joists of first floor; asbestos was placed
on the heater, but heat passed through and
the joists took fire. Heat was always above
300° F., and confined. No fires were noted
from steam-pipes sheathed in asbestos.
The inspector recommends as a safeguard
from the heating of the non-inflammable
fibrous stone an unobstructed air current
between the source of the heat and the
asbestos covering.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

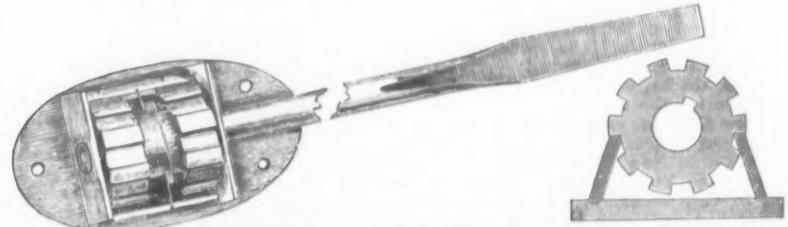
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Double-Action Ratchet Screw Driver.

ONE OF THE VERY BEST TOOLS EVER INVENTED.



The above Cut shows the action or mechanism complete, also an end view of the Ratchet and Pawls, to which we wish particularly to call your attention, as in all ratchet movements, of whatever kind or nature, the RATCHET must be the principal and most important part employed.

It combines greater Strength, Convenience and Durability than can be obtained in a common Driver.

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LIGHTNING HAY KNIVES. WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export to some trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 65 pounds weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY

HIRAM HOLT & CO., East Wilton, Franklin Co. Maine,

For sale by the Hardware trade generally.

CAUTION:

We are informed that various parties are infringing upon the widely-known Letters Patent granted originally to George F. Weymouth for an improved Hay knife.

The characteristic feature of the invention is a curved blade, provided with fine-tooth cutting, and furnished with a handle working handles. It is our purpose to prosecute all infringements, and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits have been already ordered.

All manufacturers and dealers are hereby warned of our rights, and the public are cautioned against purchasing any Hay Knives which are not of our genuine manufacture.

HIRAM HOLT & CO.

EAST WILTON, May 10, 1886.



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MANUFACTURERS OF

Swedes and American Iron Tacks of All Kinds.

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AND OUR

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WE NOW MANUFACTURE EVERY KIND OF

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for which there is a known demand.

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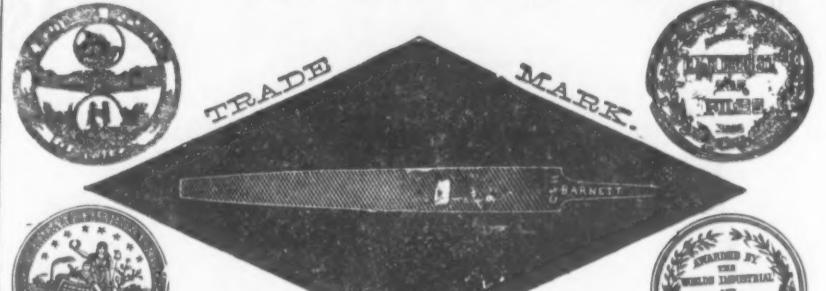
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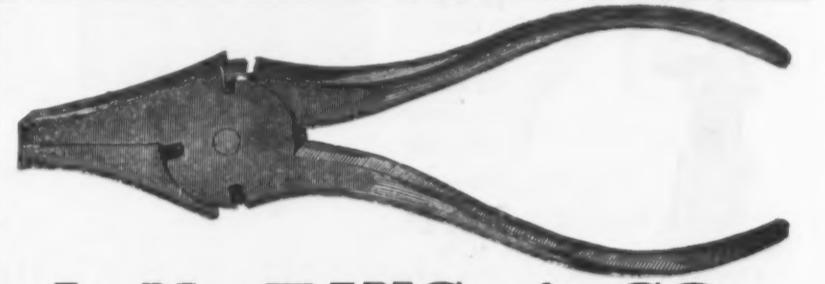
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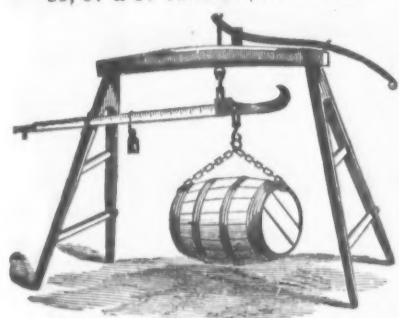
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EIMER & AMEND, NEW YORK.
ILLUSTRATED CATALOGUE MAILED ON APPLICATION.

English Letter.

(From Our Regular Correspondent.)
LONDON, May 31, 1886.

THE OUTLOOK

cannot be said to have undergone any real improvement during the week, notwithstanding the circumstance that there have been developments in Scotland of a sort considered by some to indicate "the beginning of the end." For myself I decline to prophesy; I never like to do so "unless I know," but am content to merely observe. As a result of that observation I note that Addie & Son have had to consult with their friends on ways and means, and have had certain arrangements made for them, although they are declared to be, and doubtless are, perfectly solvent. In another case several furnaces have been blown out, owing to the incidence of causes which are not as yet very clear to the outside public. Those who claim to "know something" whisper that a certain well-known firm has at last become weary of financing the producing concern, while other equally knowing persons attribute the operation in question to the fact that the firm in question has become a bull as a unit, after a very long and not wholly unsuccessful run in the bearing line. Into these somewhat occult speculative views I do not desire to enter or to necessarily concur with them. It is sufficient for me to note that uneasiness prevails and that the force of events is doing, or is likely to do, what an organization on paper failed to effect. Concurrently the large stocks at Glasgow are once more being discussed, and people are asking themselves not only why these stocks should grow and flourish so exceedingly while all around is desolation and unprofitableness, but also how the iron which goes in is taken out. Then we learn that iron sold on scrip is parceled and the buyer of the scrip is supposed to get exactly the brand and sort which are named on the scrip, whereas the buyer of warrants who may be desirous of "taking up" the iron gets exactly what the storekeeper is likely to send him—no more and no less. Were it not for the wealth and known probity of the official storekeepers there would be an early and open revolt against the whole system. As it is, nobody likes to move, albeit plenty of speculators and traders are thoroughly out of humor with the system and the manner in which it has been manipulated of late years by some persons who shall not be named here.

There was a good deal of discussion some time ago when it became known that the contract for the construction of the bridge over the Hawkesbury River, New South Wales, had been awarded to the Union Bridge Co., of New York. Now, however, John Bull has his revenge, or thinks he has, which is pretty much the same thing, seeing that the order for the steel of which the structure is to be made has been placed in Scotland. Several thousand tons are said to have been ordered from the Steel Co. of Scotland and from another concern near Glasgow, and the newspapers here are delighted that Uncle Sam with all his cuteness has to come to the "old country" for the material wherewith to build the bridge in question. This little piece of exultation is all very well in its way, and is perhaps quite pardonable, yet I confess that I wonder why, with these cheaper and better materials at our command, our bridge builders failed to carry off the order. If your people can do so, and yet come here for their steel, then it goes without saying that the credit of the achievement is doubled.

In steel-rail circles the most recent developments are of some interest, and are sufficiently striking to make some of the makers sigh for a return of the international combination. For all the orders on the board there is a very stiff fight, and nobody seems to know where the final limits of prices may be. The Great Eastern Railway Co. gave out an order for 10,000 tons the other day and it was taken by the Darlington Iron Co., Darlington, at £3. 17/6 $\frac{1}{2}$ ton, delivered at Lowestoft. From Darlington to Middlesbrough these rails will go by rail and thence by coasting steamer to Lowestoft, where the Great Eastern have a quay. Assuming that the transit charges are 8/ @ 9/ $\frac{1}{2}$ ton, which is very near the mark, the net price at the mill is about £3. 8/ or £3. 9/, which fairly "takes the cake" as the lowest figure for rails reached of late—if ever before touched. The makers are all afraid of each other and are working in the dark, so that it is an easy matter for buyers to play them off against each other in the most approved and successful manner.

THE IRON MARKET
has continued dull and shown no immediate prospects of improvement; on the contrary, last week's prices have been, taken altogether, but barely maintained, and makers are inclined to regard the situation as more hopeless than ever. The reports current some days ago as to the peculiar condition of the Glasgow market have proved to be correct, although it came as a surprise to many that so greatly respected a firm as the one in question should have had those difficulties. Meantime the warrant market has been kept fairly steady, but with an upward tendency, it being regarded as a mistake to attempt to "force" it up, as was done some little time back, with a reasonable anticipation of being able to maintain the rise for at least some little time. Closing price was 38/7 $\frac{1}{2}$ ton. The Cleveland market has been fairly firm, prices nominally ranging from 29/3 to 29/6. These are thought by some to be bottom prices, but in other circles it is openly expressed that a yet lower figure will shortly be reached. Be that as it may, it is significant that neither buyers nor sellers are anxious to contract for delivery beyond, say, about three or four months ahead. Lots, too, that have changed hands have been small. Stocks in the stores are still on the increase, but a little better inquiry is coming from the Continent, so that shipments have improved. On the West Coast a little spurt is reported in Bessemer pigs, but, while it is admitted the inquiry is in advance of what it has been for some weeks past, the difference is not yet sufficiently marked to exert an influence on prices, which for mixed parcels remain at about 42/.

A similar report has been set abroad with regard to the Staffordshire pig-iron market, but the above remarks will equally apply with the addition that prices at which transactions have been actually done are below open market quotations. Much to be desired as a revival is, the best authorities agree that, under present conditions, commercial and political, it is hardly likely to come within the next few months, and that were it to be brought about just now it would be of shorter duration than if established on a more satisfactory basis. In the galvanized sheet and wire departments inactivity prevails, nor is there anything better to report of the finished-iron branches, in many of which work is being done on short time. Old scrap continues at late rates, but nothing much is being done with it, and it is only the scarcity of materials that keeps prices up. Freights for pig iron from Glasgow by ordinary steamer continue as before, about 4/6 @ 5/ $\frac{1}{2}$ ton. Steel is not in such great demand as it has been, but at the same time the works are fairly well employed. Just now there is a lull in the inquiries for steel sleepers, but specifications are believed to be in preparation for early issue.

The combination of Scotch steel makers, which has for some time past been practically defunct, has been at length officially announced as dead. The chief cause of the break-up was the underselling of some English makers and the adoption of measures to check their competition. Old leaf-spring steel remains steady at 47/6, f.o.b. usual ports, but business done has been slight. Steel rails are down to an extraordinarily low figure, if the contract made this week by the Darlington Iron Co., Limited, can be accepted as a criterion. This firm, for an order of 10,000 tons for the Great Eastern Railway, have quoted £3. 17. 6, delivered and stacked at Lowestoft, which, at a liberal computation, can but leave £3. 0/ at the works. A standard price is not known, and for the present it would seem that each maker is working in darkness and confusion, not knowing what price to quote. In some quarters there is a disposition to advocate the resuscitation of the association, but in others the feeling is to fight, and fight desperately to the bitter end, and force on a more healthy tone. The report circulated last week that Bolckow, Vaughan & Co. had taken a large order for the Mediterranean at £5. 12/ is not correct; the quantity ordered was much below that stated, while the price mentioned is far above what it should have been. The exact figures are not known, but they are much nearer those mentioned in connection with the Great Eastern Railway orders than those previously reported. The only inquiry before the market this week worth remembering in addition to the Great Eastern Railway is one for about 1800 tons for an Indian railway.

SCOTCH PIG IRON

is somewhat unsettled for reasons alluded to above, especially because the delivery of iron (previously paid for) has been stopped from the Langloan Works on account of the financial condition of the owners of the works. The stoppage of furnaces has had a reassuring effect, but is not wholly satisfactory, as it is not clear that other furnaces may not be restarted. At present there are 89 furnaces in blast in Scotland, as against 91 on this date last year. In Connal's stores there are 76,575 tons (an addition of 5953 tons last week), as against 507,307 a year ago. Shipments were better last week, but are 32,000 tons behind to date, while the imports of Middlesbrough pig are 21,072 tons in arrears this year. Current prices are:

	No. 1.	No. 3.
Gartsherrie, at Glasgow.	32/6	40/6
Coltness,	46/	42/
Langloan,	44/	41/6
Summertown,	45.6	41/6
Clyde,	46/0	41/6
Carron,	42/	39/6
Glenrothes,	42/6	39/6
Monkland,	39/3	36/
Quarter,	39/	35/6
Govan, at Broomielaw.	39/3	36/
Shotts, at Leith.	44.6	43/6
Carroll, at Grangemouth.	47/6	44/6
Kinnell, at Boness.	45/	42/
Glenengrook, at Ardrossan.	42/6	39/6
Eglinton,	39/	35/6
Middlemington,	40/6	37/6

MIDDLESBOROUGH PIG IRON

is dull and slow of sale at about the following figures, which are for G.M.B., f.o.b. at makers' wharves in the Tees, net cash:

No. 1 Foundry.	32/	Mottled.	29/
" 2 "	31/	White.	27/6
" 3 "	29.3 @ 29/	Refined metal.	40/
" 4 "	29/	Kentledge.	39/6
" 4 Forge.	29/6	Cinder.	30/

THE NORTHERN IRON TRADE.

The official return of Mr. Waterhouse, sworn assistant to the Board of Arbitration, is as under:

Gentlemen: Having collected from the firms and companies belonging to or associated for this purpose with your board the returns of their sales of manufactured iron during the two months ending April 30 last, and having verified the same by an examination of their books, I certify the average net selling price $\frac{1}{2}$ ton to have been £4. 13/7. Beneath is a statement of the different classes of iron sold, and the average net selling price of each:

Sales During the Two Months Ending April 30 1886.

Description.	Weight invoiced.	Percentage of total.	Average net selling price $\frac{1}{2}$ ton.
Tons. cwt. qrs. lb.			£ s. d.
Rails.	563 11 2 3	1.02	4 7 8 34
Plates.	31,321 8 1 1	63.19	4 11 15 95
Bars.	10,161 1 10	21.35	5 2 0 93
Angles.	7,157 11 2 2	14.41	4 9 9 95
Total.	49,563 12 2 22	100.00	4 13 6 97

The following are the figures for the previous two months:

Description.	Weight invoiced.	Percentage of total.	Average net selling price $\frac{1}{2}$ ton.
Tons. cwt. qrs. lb.			£ s. d.
Rails.	536 8 2 18	1.25	4 8 11 48
Plates.	26,241 12 1 23	59.94	4 12 6 99
Bars.	10,156 16 8 12	22.82	5 3 10 70
Angles.	7,561 17 3 25	16.99	4 10 8 76
Total.	44,518 15 3 22	100.00	4 14 9 64

You will notice that all these prices show a slight comparative improvement.

HEMATITE PIG IRON

is quiet but tolerably steady at about 42/

Wrought Iron.
Anti-Friction.

IT EXCELS ALL OTHERS

IN

Security of Door.
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Simplicity of Application.

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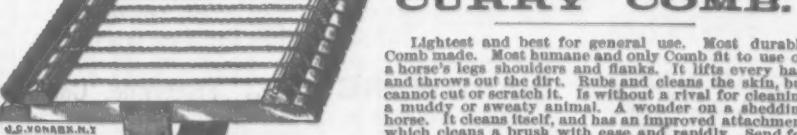
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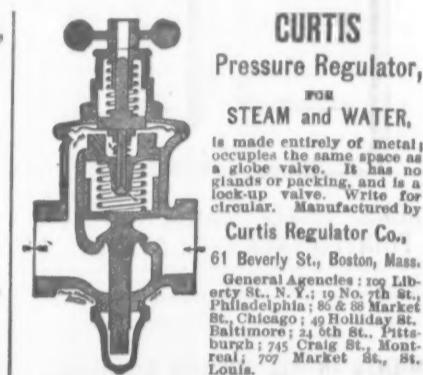
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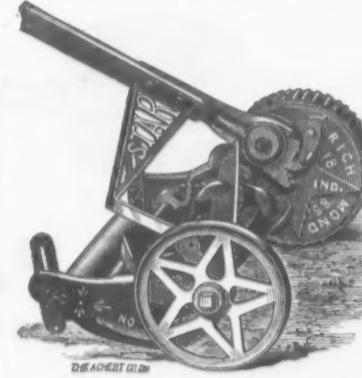
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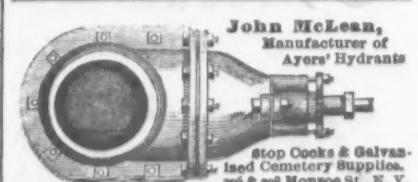
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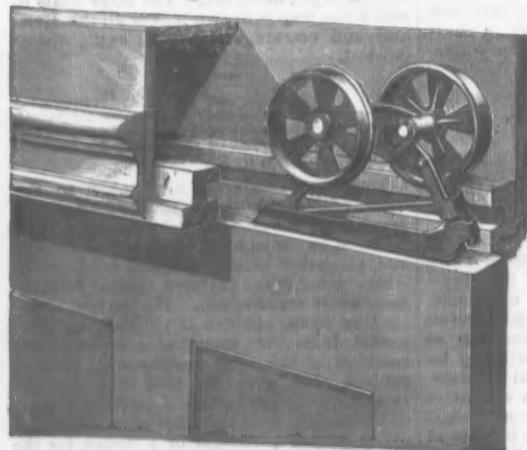
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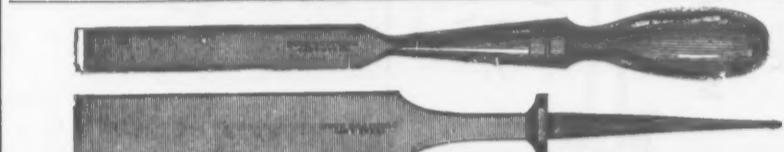
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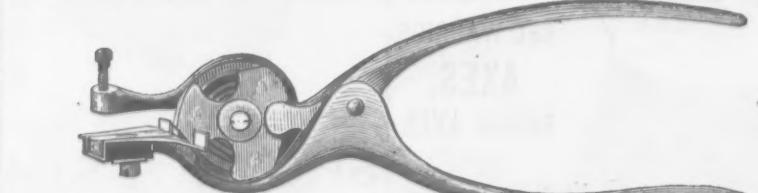
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well understood. Differences and disagreements always preceding strikes and lockouts, it is the avoidance of the former rather than the remedy for the latter for which the author wisely seeks a means. Four methods of settlement have been suggested for the prevention and settlement of labor differences: 1. *Laissez faire* or competition. 2. Legislative enactment. 3. Strike and lockouts. 4. Arbitration and conciliation. Mr. Weeks holds that the remedial method of competition is based on many wrong assumptions, and is altogether inefficient. Legislative enactments he considers to be on the whole a safe, wise and effective method, and that laws intelligently framed can be made to further the best interests of the workingman. Strikes and lockouts are treated in a measure statistically. Reports all indicate that they are enormously wasteful, and, while the author does not utterly and unreservedly condemn them, he is far from advocating their general employment. Strikes rarely accomplish any immediate good, but the author holds that their after effects are nevertheless just as real. The sum and substance of Mr. Weeks's arguments narrow down to advocating arbitration. This he considers as the true solution of the present difficulties, and in its general adoption he would foresee a speedy quieting of industrial strife.

PRACTICAL TREATISE ON GEARING. Size 5 $\frac{1}{4}$ x 9 $\frac{1}{4}$ inches, 121 pages. Published by the Brown & Sharpe Mfg. Co. Price, \$2.10.

This interesting book, of which we received a copy a short time since, is specially designed for the use of practical men, and will unquestionably meet with a most favorable reception. Information such as it contains has hitherto been difficult, if not impossible, to reach, and those who are in any way interested in the subject will not be slow to appreciate the many good features of the method of treatment. It has, of course, been impossible to completely eliminate mathematical manipulations, since these are practically connected with the subject in an inseparable manner, but the utmost possible simplicity has been arrived at, and no great difficulty will be experienced in following the various operations. The book is divided into two parts of 12 and 11 chapters each, is profusely illustrated, and contains practical examples showing how to apply the rules given. The book is a valuable addition to the literature of the subject, and as such will be heartily welcomed.

MECHANICS AND FAITH. A Study of Spiritual Truth in Nature. By Charles Talbot Porter. New York and London. G. P. Putnam's Sons.

The author of this thoughtful book, who is well known as a mechanical engineer, and to a large and attached circle of personal and professional friends as a man of rare qualities of mind and heart, evidently appreciates the manner in which its title will strike the reader, as he remarks that mechanics and faith will seem to most persons to express the opposite extremes of thought, and their association to be the bringing together of subjects which are quite incongruous, and between which no relations can exist. This frank acknowledgment tends to disarm criticism at the outset, and prepares the way for his argument, the purpose of which is to show the harmony that exists between reason and faith by the aid principally of the analogies and illustrations furnished by mechanical science. In the discussion the power which mechanical science is actually exerting, although it may have received but little credit for it, in guiding the development of thought and belief respecting spiritual truth, is shown, while the larger work which it is still to do, in preparing the way for a philosophical system in which faith shall be fully recognized and honored, is referred to at length. The peculiar adaptation of this branch of science for this service, is indicated in the somewhat surprising claim that the beneficial effects of mechanical science on our physical well-being are surpassed in intrinsic importance by its healthful influence on thought, belief and morals, and generally on the spiritual nature of men. Concerning this influence of mechanical science the author makes the following statement which indicates the scope and object of the argument:

It is of a nature to aid directly in establishing in the mind the solid foundation of faith. Its immediate tendency is to dispel the idea of antagonism between reason and faith, to show that antagonism exists only between reason and credulity, and to vindicate the authority of faith over its own vast region. It shows that faith is consistent with the highest intelligence, that all true philosophy leads up to faith, and that the larger and more complete the comprehension of truth becomes the more absolute faith must become.

We cannot follow the steps of the argument by which our author seeks to lead the reader from the ground occupied by the disciple of mechanical science into the reality of spiritual things and the fundamental postulates of Christian faith. There are, however, some points in the argument to which we may call attention as indicating its scope, and something of the author's way of regarding nature and truth. The position is taken at the outset that this branch of science, dealing as it does, not with matter, but with force, the unseen and eternal, is peculiarly fitted to carry the thought beyond things physical and visible. Force is insisted on as a spiritual reality, and this fact is the key to the author's reasoning and the starting point of his argument. This leads to the conception of natural law, which instead of being a substantive reality can express nothing except the uniform mode of action of a Being, which is subsequently shown to be the uniformly benevolent action of a Being. In this view of force, bearing as it does against materialism, the author is probably in sympathy with Dr. Carpenter when he remarks, with reference to nature, that we should not speak of government by laws, but government according to laws, although Mr. Porter's conception more directly recognizes force as the divine energy. The materialistic views of nature are further combated in an argument against the atomic theory which is regarded as the bulwark of materialism. This discussion is interesting and able, and will repay a careful perusal, while not all will agree with the conclusion by which

not only the atom, but matter itself, is dispensed with, and force, "the manifestation of a personal and present God," is regarded as the reality in and behind what are commonly termed "material forms." But there is a close kinship between this view and that held by a growing school of Christian philosophy, the tendency of which is to regard the natural as more and more supernatural, and the supernatural as more and more natural, thus abolishing the distinction between the two and making them to be essentially one.

We cannot dwell on the line of reasoning, striking and original, by which, starting with force, the most obvious spiritual reality, truth, beauty and love are presented as spiritual realities also, manifested through nature and essentially identical, and are shown to lead to the supreme reality, an infinite Being in whom they inhere and of whom they are the manifestation. In the course of this argument, which closes with such topics as the verbal revelation, faith and prayer, and treating as it does of some theological and many philosophical and metaphysical subjects, views are expressed in which not all will agree, and positions taken which will be questioned, but the discussion as a whole will be found exceedingly suggestive and interesting, illuminated as it is with many striking illustrations and analogies derived from or connected with mechanical science.

The American Protective Tariff League.

A meeting of the Board of Managers of this association was held recently at the office of the Delaware and Hudson Canal Co. in this city for the purpose of completing the organization and the election of officers. The following gentlemen comprise the Board of Managers: Thomas Dolan, of Philadelphia, and Horace K. Thurber, of this city, having been chosen to fill vacancies: Col. Le Grand B. Cannon, coal and iron, New York; Ex-Gov. P. C. Cheney, paper manufacturer, New Hampshire; Hon. George Draper, textile manufacturer, Massachusetts; Hon. George H. Ely, iron ore, Ohio; Hon. Smith M. Weed, iron manufacturer, New York; Hon. Henry B. Metcalf, hair cloth manufacturer, Rhode Island; Cornelius N. Bliss, cotton manufacturer, New York; William P. Shim, Pennsylvania; Henry T. Cook, pottery manufacturer, New Jersey; Levi L. Brown, cotton manufacturer, Massachusetts; Charles H. Cramp, shipbuilder, Pennsylvania; William Strange, silk manufacturer, New Jersey; Edward M. Knox, hat manufacturer, New York; Oliver Williams, wrought iron and steel manufacturer, Pennsylvania; David Harpster, wool grower, Ohio; Theodore M. Ives, thread manufacturer, Connecticut; Edwin A. Hartshorn, flax manufacturer, New York; Arthur W. Soper, railroad engineer, New Jersey; Thomas Dolan, woolen manufacturer, Pennsylvania; Horace K. Thurber, foreign commerce, New York. The meeting was called to order by Col. Le Grand B. Cannon, who stated that it had been called to hear and act upon the report of the Committee on Nominations. Mr. Edward H. Ammidown, of that committee, reported that they had been unable to agree upon the nomination for president, and would therefore submit that question for the action of the Board of Managers. For the remaining offices, Executive Committee and for vice-presidents of States the nominations of the committee were unanimously confirmed, and subsequently Mr. Edward H. Ammidown was unanimously elected president of the League. As completed the officers chosen were as follows:

Organization.—President, Edward H. Ammidown; first vice-president, Hon. Thomas H. Dudley, New Jersey; general secretary, Hon. Robert P. Porter, Pennsylvania; treasurer, Chester Griswold, New York.

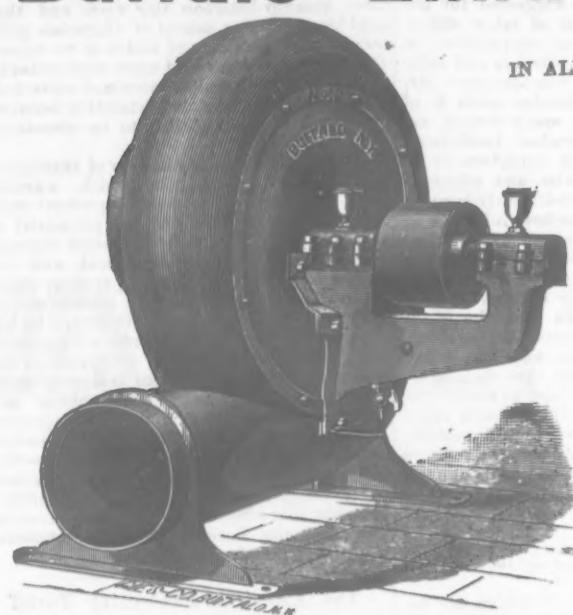
Executive Committee.—Cornelius N. Bliss, New York; Hon. George H. Ely, Ohio; Hon. H. B. Metcalf, Rhode Island; William P. Shim, Pennsylvania; Henry T. Cook, New Jersey.

Vice-Presidents.—Hon. James H. McMullan, Maine; Abbott Lawrence, Massachusetts; Herman F. Straw, New Hampshire; Ex-Gov. Redfield Proctor, Vermont; Edward P. Taft, Rhode Island; Hon. Thomas Wallace, Connecticut; Hon. Ellis H. Roberts, New York; Hon. John H. Ricketson, Pennsylvania; Hon. T. F. Gause, Delaware; Hon. Albert Small, Maryland; Col. Robert Sayer, Virginia; Hon. N. Goff, Jr., West Virginia; Frederic Kidder, North Carolina; D. E. Converse, South Carolina; Col. John Screen, Georgia; Samuel Noble, Alabama; Hon. Louis Bush, Louisiana; A. M. Shock, Tennessee; Capt. Silas F. Miller, Kentucky; Hon. J. H. Wade, Ohio; Hon. John C. New, Indiana; Hon. Alexander Sullivan, Illinois; Hon. Francis B. Stockbridge, Michigan; Hon. Horace Rublee, Wisconsin; Ex-Gov. John H. Gear, Iowa; E. A. Hitchcock, Missouri; Gov. G. A. Pierce, Datota; Hon. G. W. E. Dorsey, Nebraska; Hon. W. A. Peffer, Kansas; A. H. Danforth, Colorado; Hon. A. L. Morrison, New Mexico; Robert E. Morrison, Arizona; Hon. Joseph Jorgensen, Washington; Hon. M. C. George, Oregon; A. P. Haraszthy, California.

Upon motion it was voted that the Executive Committee be authorized to appoint a secretary for each State and Territory of the Union; to appoint a chairman and corresponding secretary for any county organization which might be formed; and for the purpose of facilitating intercourse between local organizations and the Central Bureau of the League it was empowered to appoint seven secretaries of division, to be the executive officers of the League in different parts of the country, subject to the direction of the general secretary; and also to appoint as many assistant general secretaries as might be required to carry on the work of the League.

The Mallet compound locomotives first introduced on the Bayonne-Biarritz road, in France, are now in operation on the North of Spain and the Southeastern of Russia. On the latter road the regular four-coupled engines are being converted into compounds by replacing one of the cylinders by a larger one of 23 $\frac{1}{2}$ inches diameter.

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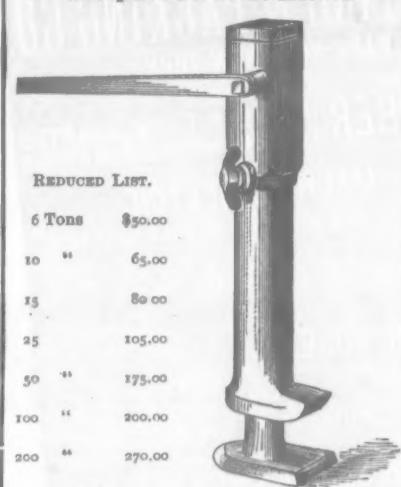


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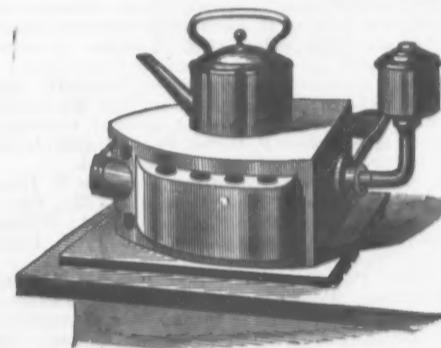
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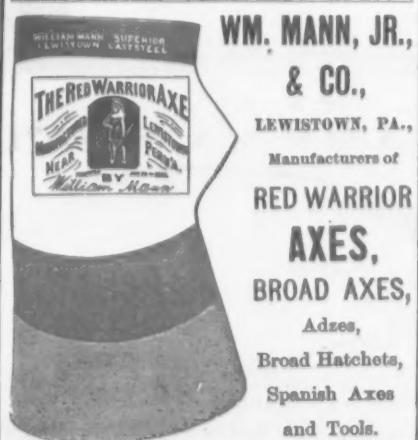
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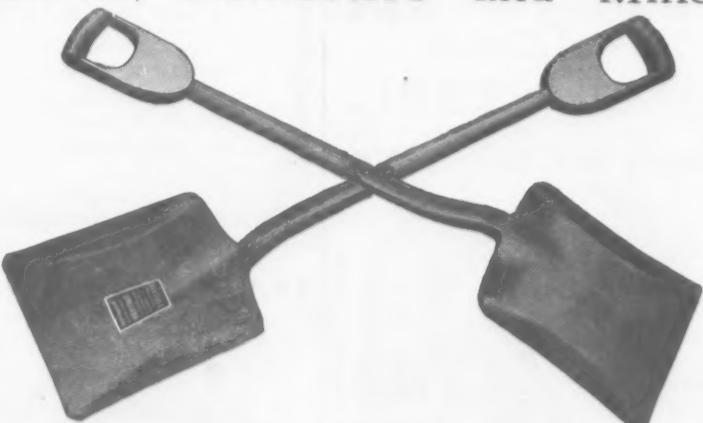
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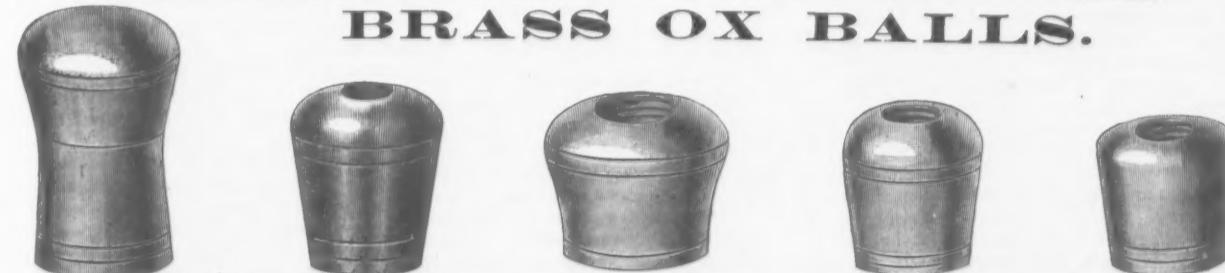
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A Forty-Knot Ship.

Prof. R. H. Thurston closes a paper in the Forum on "The Limit of Speed in Ocean Travel" with these words: "It may, however, be considered as not at all improbable that those of us who live to the next century may see the Atlantic crossed in less than four days."

To accomplish such a result vessels must be built capable of attaining twice the speed of the fastest steamers now plying between Europe and America. The two great Cuadros, the Umbria and Etruria, can make in a smooth sea about 20 knots, or 24 miles, an hour. The beautiful and ill-fated Oregon was scarcely inferior, and the America and the Aurania are of but little less speed. Therefore a ship equal to the work expected by Professor Thurston must steam at the rate of 40 knots, or about 47 miles, an hour. This done, she would cross the Atlantic in 80 hours, or in less than 3½ days.

The Oregon was 500 feet long, 54 feet breadth of beam, and of 7500 tons measurement. The Etruria 520 feet long, 57 feet beam, and of 8000 tons burthen. The levitation suggested by Professor Thurston as the ship to cross in 80 hours he makes 800 feet long, 80 feet beam, of 25 feet draft and 38,000 tons burthen. To make the speed of the Oregon such a vessel, under a rule of naval architecture, would require 35,000 horse-power, as against 12,000 in the smaller steamer.

The law is that to double that speed, or raise it to 40 knots, eight times the power needed for 20 knots would be required; but, inasmuch as the law of resistance becomes much more favorable at these higher rates of speed, Professor Thurston fixes the limit of the probable power required at 250,000 horse-power.

The weight of the steam machinery for the new ship he estimates at 7500 tons, or the total tonnage of the Oregon, and the consumption of coal at 175 tons an hour, 3200 tons a day, or 10,500 for the voyage. The weight of fuel and machinery would therefore be 18,000 tons. Allow 12,000 tons, or, according to the present construction, about one-third of the total displacement—for the weight of the hull, and 8000 tons would be left for passengers, crew and cargo. Of course many problems would have to be solved in the construction of the machinery for a ship so enormous, but experience indicates that they would be conquered if there was a demand for the vessel. The engineer and the shipbuilder will be equal to the work when they are called upon to perform it.

There is however, an important economic obstacle. To-day, as Professor Thurston says, the fastest ships do not pay expenses, and there will be no incentive to increase the speed so long as that is the case; but when more passengers and more precious freight can be found to pay for the faster ships, faster ships will be built." He estimates that the cost of running his ship would not be less than \$75,000 for each voyage, to pay which sum the passage money of 500 passengers at an average of \$150 a head would be required. Then the profit could be made on the freight and mails carried. Would the saving of three or four days' time induce sufficient travel at such rates as to make it worth while to go to the enormous expense of building and running the vessel? Just at present it is hardly doubtful that the steamship companies would give a negative answer to that question.

1 Month's Work of a German Wire Works in Galvanizing.

A German contemporary gives the following figures covering the product of a wire mill running two sets of 14 reels, adding also the increase of weight due to galvanizing:

Number,	Bright German scale.	Galvanized Metric tons.	Gain in weight.	Per cent.
50.....	65,460	66,460	5,000	7.5
45.....	7,830	8,120	447	5.6
40.....	94,605	98,150	4,545	4.8
35.....	1,590	1,680	90	5.6
34.....	3,610	3,945	335	9.1
38.....	2,365	2,400	35	1.5
50.....	7,740	8,275	535	6.9
35.....	11,645	12,675	1,030	7.0
24.....	0,835	0,845	10	1.2
20.....	6,495	6,885	390	5.8
15.....	0,990	0,960	-30	-3.0
10.....	2,595	2,865	270	10.4
9.....	0,825	0,865	40	4.8
Total.....	136,360	143,032	6,672	4.9

The consumption of spelter per metric ton of galvanized wire is 110 kg., or 11 per cent. But about 50 kg. of hard zinc are recovered, from which 40 kg. of a low grade of zinc can be obtained. The consumption of sal ammoniac is 4 kg. per ton.

Dr. T. M. Drown lectured recently before the Boston Society of Arts on the "Little Bessemer" process, going, of course, over ground which has been thoroughly examined before. There is one paragraph in Dr. Drown's lecture which we believe may be of interest to give: "It has long been a matter of comment that in Sweden pig iron is successfully blown that contains much less silicon than that used in other countries. Mr. Firmstone, of the Glendon Iron Works, Easton, Pa., has, I think, given the first satisfactory solution to this phenomenon—namely, the much larger proportion of carbon dioxide in the gases of the Swedish converter. It is evident that when the carbon is merely burned to carbon monoxide there is much less heat generated than when it is burned to carbon dioxide. In other words, in Swedish practice there is more air blown in proportion to the amount of pig iron used than is usual elsewhere, and consequently some of the carbon soon reaches its highest point of oxidation. Side blowing, now generally practiced as a remedy for cold charges, is effective for the same reason."

Prof. J. von Ehrenworth, of the Leoben School of Mines, Austria, sends us reprint copies of two of his contributions to recent issues of *Stahl und Eisen*. The first is a description of G. A. Forssberg's three-tuyere charcoal fineing fire, which has been widely introduced in Sweden lately, with good success. Its principal advantages are greater economy of fuel, saving in labor, and greater certainty in obtaining a uniform product with less skilled men. A second paper describes and illustrates Ehrenworth's patented

puddling furnace, with direct gas-firing and air heated in a regenerator. Professor von Ehrenworth goes into an elaborate theoretical discussion in support of his design.

Foreign Markets.

FRANCE.

PARIS, May 31, 1886.—Metals.—Have been less active, but unaltered. We quote at the close: Copper—Chili Bars, 108.50 @ 107.50 francs 30 kg.; Ingots and Slabs, 112.50; Best Selected, 115, and Pure Corocoro Oro, 107.25. Tin—Banca, 257.50; and Straits, 255; Australian, 267.50; and English, 267.75. Lead—28 @ 28 and Spelter, 27.50 @ 28.20. Zinc—An abnormal condition of the iron market in this city continues, dealers hesitating in selling Merchant and Flooring Iron as low as the rolling mills. Either the former lose money or the latter sell them with a notable rebate. In the interior the firm feeling which developed during the month continues to prevail in view of the activity in all sorts of public works, as well as for the navy, positively in prospect. Orders for Railroad Material have also been received from Panama and Algeria. The Iron-Ore mines of the latter produced in May 19,000 quintals of iron in 1885, and Galloway Alm-Morat, 187,947 tons; Khazan, 23,492; El-Kimem, 7000; and Ain-Sedina, 31,828. In the Province of Algiers one Iron-Ore mine was worked in 1884, the Djebel-Haddid, and in Oran the Camerata Mine. The resources of Algeria are great also in Copper, Lead, Spelter and Antimony. There are being worked \$4 Iron & Co. mines in Constantine, 15 in Algiers and 4 in Oran. Coal has been moderately active and steady.—*Moniteur des Intérêts Matériels*.

BELGIUM.

BRUSSELS, May 31, 1886.—Iron.—The Belgian Iron market continues quite quiet. Although the export demand has diminished since prices were fixed, makers taken as a whole, have plenty of work on hand. Prices fixed by the syndicate have not been swerved from, but in order to maintain prices where they are now it may be necessary to curtail production. Proposals have been made to effect to members of the syndicate, and it is believed an understanding will soon be arrived at. Luxembourg Puddling Pig has been selling at 3.80 francs per kg.; Charleroi at 3.80 @ 4.70; Foundry Iron at 4.70; and do. Luxembourg, 3.80 @ 4.70. Merchant for export companies have hitherto 10 francs, with 50¢ difference between numbers, and the difference if used at home. Beams may be quoted 10 francs, and Angles 11.60. Sheets may be called 12.50, No. 2; 14.50, No. 3, and 20.50, No. 4. Thomas Steel production since its introduction has been as under:

Coal since the Government adjudication has been steady.—*Moniteur Industriel*.

GERMANY.

HAMBURG, May 31, 1886.—Iron.—There has been no essential change in the Iron market in Rhenish Westphalia, but it looks as though bottom had been touched. There has been an improved demand for Puddling Pig for the next quarter, which will be met, while steel is still quoted. Foundry Pig, on the other hand, remains neglected. Foundries are not being fully occupied. Large lots may be shaded. Spiegel is sustained with difficulty, both the export and domestic demand being slack. Thomas, Bessemer and Luxembourg have stood their ground latterly. In the rolling mill branch matters continue unsatisfactory, nor is much of a steady favorable change in prospect. Merchant and Beams are, it is true, in better request, but not on par with the current output. Sheets are in moderate demand for construction and home use; this may also be said of Coarse Sheets, especially as regards the foreign demand. While Wire Rods are as sluggish as before, the demand for Wire Nails is a little better. Steel works are busy on railroad material, with some orders for the same ahead. At a 10-mark reduction the price for Steel Rail is still a paying one for export. Metals are unchanged. Lead is quiet and weaker. Copper steady. Spelter is in better request, consequent of a further 5% reduction of output agreed to, dating from July 1 next.—*Borsenkalender*.

CHILI.

VALPARAISO, April 16, 1886.—Copper.—Producers since the 2d of March have been holding back, and with the decline in exchange, have succeeded in gradually raising the price despite unfavorable cable advices. Sales, 20,800 quintals, at \$17.40 @ \$18.35; \$18.10 equals £41.5/7 in England. Nitrate.—Pending the general meeting of producers to come off on the 2d prox. at Iquique, little has transpired, sales not exceeding 240,000 quintals, at \$3.15 @ \$3.30, 95% equal to 8/6 in England. March exports to Europe from Iquique, Pisagua and Callao, 548,388 quintals; from Talca and Puerto Oliva, 75,682; together, 618,000.

Shipments During the First Quarter.

1884.	1885.	1886.	
Quintals.	Quintals.	Quintals.	
To the North of Europe.....	1,974,815	1,920,000	985,488
To the Mediterranean.....	105,238	26,582	35,396
To the United States, Atlantic Coast.....	506,469	822,016	805,978
To the Pacific Coast.....	59,583	17,586	68,118
Total.....	2,676,370	2,118,444	1,406,721

Charters, 18,780 tons for Europe so far this month. Coal is dull. We quote Newcastle West Hartley, 20/—; Orrell, 18/6; Australian, 15/ and 17/6; Smelt, 20/ @ 21/6; Chile, 20/ @ 21/6. Exchange gave way to 25/4d., 90 days, London.—*Weber & Co.*

HOLLAND.

ROTTERDAM, May 27, 1886.—Tin.—After a slight improvement of 1/4 guilder the market weakened again, declining to 87.50 @ 87.75 Banca and 87.35 @ 87.50 Billiton. May 28.—The market closes quiet to-day at 85 Banca and 87.75 @ 88 Billiton.—*Koch & Vletterboom*.

SPAIN.

BILBAO, May 31, 1886.—Iron.—The Iron-Ore market has been flat; so little has indeed been done that a quotation can hardly be given except it be a nominal one. Whatever was shipped came in good condition. Freight was slightly improved, than 2d. advanced, has been paid for Cardiff and Newport, establishing a 4/ freight; no further rise in freight need, however, be expected while business remains slack. Shipments to date, 1,321,604 tons, against

The Iron Age

AND METALLURGICAL REVIEW.

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JAMES C. BAYLES, - - - Editor.
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REMOVAL.

The office of this journal is removed to 66 and 68 Duane Street.

Combinations in the Iron Trades of the Continent.

During the past year every mail bringing news concerning the iron and allied trades on the Continent has been burdened with accounts of "syndicates" proposed in some lines, or of the doings of established pools in others. In Germany particularly there has been a positive craze for combinations. Ardent advocates have in turn smoothed over existing difficulties and proposed new remedies for evils as they cropped out. There have been those even who, imbued with the idea that Government action is the panacea for all ills, have held that new works should only be allowed to be built when their necessity has been officially passed upon. It is curious to observe how experience abroad has thus far followed in nearly the same lines which have characterized the course of the majority of pools in this country. The same dangers menace it from within the fold, the same opposition threatens it from those outside the artificial circle drawn. In Germany, for instance, it was soon found that pools based upon a restriction of output without any further arrangement as to prices, &c., rested on a weak foundation. Every one was eager to be the one producer outside of the combination who could enjoy the benefit both of full employment and stiffer prices due to the sacrifice of others. Such pools, the simplest in form, are possible only under exceptional conditions. The number of works must be small, their product identical in quality, or nearly so, and their output be such as to be readily and quickly controlled. Once well started, their prospects of success are fair, unless time stoppages, combined with temptingly remunerative returns, do not lead to so rapid a growth in capacity by extensions and additions that it becomes dangerously unwieldy.

A second simple method is to arrive at an agreement not to sell below certain prices. In this case both natural causes and the trickery of a few assail the integrity of a pool and lead it to an early end, in spite of penalties and other devices. Some of its members make a product bearing a favorite

brand, to which preference is always given, prices being uniform. Others are able to exert influence, making sales larger and more favorable. The result is that some works are crowded with business and others are idle, even if every member of the pool is living strictly up to his engagements. This is, however, rarely the case. Private drawbacks, excessive freight allowances, concessions on goods not included in the combination, invoicing smaller amounts than those really shipped, extending old contracts at cut rates, &c.—all these devices are so frequently resorted to that it has become the axiom among a large majority of manufacturers that a combination is a particularly good thing for those who go into it with the object of being dishonest. A third form has become popular in Germany which is comparatively unknown in this country. It consists in forming a syndicate in which all the works turn over the exclusive sale of their products to one central office, being under heavy penalties not to sell direct to any customer. After deducting the selling expenses, the agency prorates the income, the orders having been distributed according to the basis agreed upon in forming the combination. That is to say, the business management of a concern is practically turned over to a bureau in whose integrity, of course, all must have absolute confidence. In Germany, where the technical management of iron works is rarely subordinate to the business department, and where conflicts between the two are only too frequent, this divorcing of important functions would not be considered so intolerable as it would be to the majority of proprietors in American establishments of the same character. Enough experience has not yet been gathered in the working of this pooling plan in Germany to gauge its possibilities.

In a recent issue of the *Génie Civil*, however, M. P. Bayard discusses the history of the Comptoir Métallurgique de Longwy in a manner not calculated to give much encouragement. It was formed in 1870 by the group of blast furnaces in French Lorraine. One of the first results of the formation of the pool, when prices declined, was to kill off those mills which, not having furnaces, had to buy their forge pig. They had to contract for long periods, and the rolling mills who were in the pig-iron pool by reason of ownership of furnaces simply sacrificed a part of their profit as furnace men to capture all the trade they wanted as mill owners. Furnace after furnace was put up, and from 1877 to 1883 the product nearly doubled, the number of furnaces being 42 in 1883 against 31 in 1879, when the combination was formed based upon one general selling agency. It soon became necessary to reduce the product and to seek new markets. At first it was decided to restrict the monthly output of 40,000 tons by 5000 tons, and the system was adopted of asking for bids for the premium on stoppage, as much as 5 francs per ton being paid. This system went on until the impossibility of continuing it was recognized. Proportionate restriction of output by all was then introduced, and in three years the point has been reached where this restriction amounts to 62½ per cent.—that is to say, the furnaces run only to one third of their capacity. Of course the pool soon found outside competition in its own district, a number of new plants declining to share in its blessings. Closely pushed at home by growing make and lessened consumption the pool reached out in all directions for new trade. With long hauls and heavy freights against it, it fought other districts in their own markets and tried to dislodge Scotch and English irons from the seacoast towns at enormous sacrifices, and yet stocks piled up, a constant menace, should the pool collapse, to the entire iron trade of France.

Thus in its seven years of existence the Comptoir de Longwy has become the most striking example of disorganization which such a combination may produce. Throttling independent industries, it diverts capital into plant for the product of which there is no legitimate outlet, and ends in spreading disaster far beyond the confines of its own domain. In the case of the combination quoted natural causes contributed toward suppressing one tendency which may make such pools abroad even more far-reaching in their consequences. We allude to the natural desire to relieve home markets by invading foreign countries. Instances are on record in some trades in which such syndicates in Europe have followed the system of placing their surplus in this country at any sacrifice, and, instead of being lessened, that danger has grown during the past few years.

International competition in the steam-engine trade has taught some English builders things worth knowing, and has demonstrated to them in a very striking manner that their business methods may be much improved. Recent British consular reports have to a great extent confirmed what has of late been said about the falling off in the demand for British machinery, and show that German and American products are now far in advance and steadily gaining favor. A careful study of English machinery exhibits, as made by some of the English papers, furnishes all that is necessary to explain the existing conditions: poor design, poor workmanship and poor performance encountered in the engines have secured for them a reputation which it will take some time and conscientious work to efface. Some of the smaller types of stationary

engines, to quote an English paper, "lack any attempt at design, and red lead and lamp-cotton enter so very largely into their construction that it may be seen peeping out of every joint and connection." It is not surprising that engines of this character meet with little or no demand, and Americans can among other establishments have not been slow to profit by it.

Our Trade with British Guiana and Honduras.

Domestic export to British Guiana and Honduras increased in volume last year. The former is the only British colony in South America, and the latter in Central America; both are in a flourishing condition and of great promise. Guiana extends from east to west about 200 miles and includes the settlements of Demerara, Esequibo and Berbice. It is bounded on the east by Dutch Guiana, from which it is divided by the River Corentyn; on the south by Brazil, on the west by Venezuela, and on the north and northeast by the Atlantic Ocean. The territory was first partially settled by the Dutch West India Co. in 1580. It was from time to time held by Holland, France and England. It was restored to the Dutch in 1802, but in the following year retaken by Great Britain, to whom it was finally ceded in 1814. It is impossible to specify the exact area of the colony, as its precise boundaries between Venezuela and Brazil respectively are undetermined, but it has been computed to be about 100,000 square miles.

The forests of British Guiana abound in woods of rare beauty and value. Some of the hardwoods are, from their remarkable durability, peculiarly suitable for house and ship building purposes, while others are equally prized for the manufacture of household furniture. The staple products of British Guiana were in former years sugar, rum, molasses, cotton and coffee, but the cultivation of the two last-named articles has for many years past been almost entirely abandoned. The soil of some parts of the colony is, however, still capable of producing coffee of rare excellence. The Berbice River coffee was once much prized, but these two industries have now given place to the cultivation of the sugar-cane, which at present is the chief industry of the colony, and furnishes nearly 92 per cent. in value of its exports. There are 105 sugar estates in active operation, having an aggregate of sugar-cane cultivation of 79,502 acres and of plantain cultivation of 2553 acres. The sugar crop of 1884 yielded about 140,000 hogsheads; the bulk of the production is the high class sugar known as "Demerara crystals." Further attention is being given to the planting of coffee and cocoa on the vegetable soils to the rear of the cane grove, and several abandoned coffee estates are being reclaimed. Rice is now grown to a considerable extent on the Coolie settlement at "Huist Dieren," and by free coolies on the savannah lands behind the sugar estates. The great extension of sugar cultivation is due to the enlarged labor supply, and labor alone is wanted to extend this cultivation almost without limit.

The climate is hot, but not unhealthy; the mean temperature throughout the year is about 82°. The capital is Georgetown, possessing a population of upward of 50,000 souls. The regular periodical mail communication is maintained by the vessels of the Royal Mail Steam Packet Co., which leave Southampton every alternate Thursday. The total population in 1871 was 193,491; by census of 1881, 252,186. The estimated population of the colony on December 31, 1884, was 264,063, made up of Aborigines, 7538; East Indians, 86,848; Chinese, 3605; Portuguese, 11,917; Africans, 4521; natives of British Guiana and West Indian Islands, 149,544. Immigrant population on estates, December 31, 1884:

	Under indenture.	Not under indenture.
Indians.....	15,251	45,924
Chinese.....	2,009

The revenue in 1875 was £352,136; expenditure, £355,079; 1884, respectively, £460,932 and £449,785. Public indebtedness December 31, 1884, £75,000. Aggregate debts of public bodies guaranteed by the Colony, £125,303. The imports in 1875 were £1,837,151; exports, £2,338,121; 1884 respectively, £1,999,448 and £2,322,032.

British Honduras is situated on the east coast of Central America, bounded on the north by Yucatan, on the west again by Mexico, on the south by Guatemala, and on the east by the Bay of Honduras. The coast was discovered in 1502 by Columbus. The Indians and mahogany and logwood cutters occupying the country were never subdued by the Spaniards and Central Americans, but they voluntarily accepted a British protectorate, which became a colony on May 12, 1862, and its former relationship with Jamaica was severed by letters patent bearing date October 2, 1884.

The area of the colony is 7562 square miles. On exploring the country more thoroughly in 1879 it was found that the more valuable western portion was an undulating, grassy country, forming magnificent pasture lands. Toward the coast it was all forest, which was full of valuable timber. The soil generally was rich, but a few rugged spots were encountered. Some fine gold-bearing quartz veins were discovered, and other indications of minerals were noticed. The Pine and Cahoon ridges afford abundant pasture for cattle, and the higher grounds would doubtless produce, at altitudes varying from

600 to 2000 feet, as marketable a quality of coffee as any that is brought for export from the neighboring Republics. For the present, however, and until more capital and labor shall have been introduced, and in the absence of roads, it is to the virgin soil of the valleys and lower plains that the settlers must look for remuneration from their agricultural pursuits. Upon this soil the most luxurious crops of sugar are being grown from cane that will rot on for years.

There seems to be no tropical product to which the climate and soil are not adapted. In the forests and wilds are found the cedar, rosewood, bullet-tree, justic, lignumvitae, sapodilla, Santa Maria, ironwood, red and white pine, india-rubber and gutta-percha trees, and the sarsaparilla, cochineal cactus, agave or pita, indigo and many other useful plants or shrubs, without speaking of the usual tropical nuts, fruits and cereals, cocoa and tobacco. The cultivation of bananas and plantains and their shipment to New Orleans are gradually extending and proving remunerative to planters. Fruit trees, spices and coco are being planted, and promise a new field of development. The climate, though damp, is for the tropics healthy. Land may be purchased from the Crown at 4/ per acre. The revenue in 1875 was £41,906 and the expenditure £40,830; in 1884 the figures were respectively £51,866 and £53,585. There is no public debt. The population was reported on April 5, 1881, to be 27,452. The imports amounted in 1875 to £175,321, and the exports to £202,512; in 1884 the figures were respectively £237,538 and £317,449.

American Trade.—

British Guiana. British Honduras.

Calen-
dary. Import. Domestic
1885. \$1,184,759 \$1,649,586 \$228,236 \$263,423
1884. 1,722,477 1,613,514 242,887 356,782

Sugar importation from Guiana has fluctuated widely, between 13,074,378 and 123,331,060 pounds in a year, in accordance with prices ruling. Demerara crystals are much appreciated in this country, but importations fell off while some difficulties about classification and the alleged coloring to get in at a lower duty were pending with our custom-house. After an understanding had been arrived at importation was vigorously resumed. The goods shipped to the colonies named were chiefly breadstuffs and provisions and a little of everything we ship to the tropics.

The figures we have given relating to both countries are suggestive of a few remarks by way of comparison with the Spanish American countries and Brazil. In the first place, it will be noticed that there is hardly any public debt in Guiana and none in Honduras; and, in the second place, that current expenditure is exceedingly moderate. Both colonies, considering their size, are eminently productive and prosperous. They inspire confidence, because there are neither political nor labor troubles. Indian coolies perform plantation work in Guiana and are returned to their native land at their option upon expiration of the contract. Most of them, however, prefer to settle permanently in the colony. In this manner Guiana has been able to dispense with black freedman's labor almost altogether.

In Brazil the labor question causes statesmen and economists, as well as planters themselves, considerable misgivings, now that the negroes are fast being emancipated. Chinamen are to be introduced, but it is feared they will never stay any length of time on the sugar estates; they may on the coffee plantations. Indian coolies would be a better importation, but these cannot, we believe, be induced to emigrate to Brazil, where they would not meet with the religious toleration existing with respect to their habits and prejudices in Guiana. The result of what we have mentioned is that these two colonies develop steadily and normally, while either in point of finances or politics and labor most of their neighbors have differences to contend with which periodically lead to some crisis involving loss not only to themselves, but to those nations who trade with them or lend money to them. The financial disasters have been such and so frequent in some of the Spanish-American countries that their Governments could raise no money at present except on undoubtedly secured, and capitalists generally avoid them even more than they would Turkey.

The steel-rail manufacture continues to be prominent among the leading branches of the iron and steel trade as the one which is in the healthiest condition and is most remunerative. According to the report of the Board of Control, the sales for delivery in 1886 had on the 1st of June footed up to 956,600 gross tons, against 926,805 tons on the 1st of May. This, however, does not include a number of important sales practically closed during May, though the final formal signatures have not been appended to the contracts, nor does it embrace the business done during that month by the Western Steel Co., the old Vulcan Mill. This concern has been admitted into the pool, an allotment of 50,000 tons being granted to it.

Taking these facts into account it is safe to say that on the first of June the 1886 orders placed aggregated fully 1,000,000 gross tons. We question whether there is a mill in the country to-day which can fill new orders for delivery in July; many are booked completely for August, and some even for the greater part of their September output. A few mills have obtained a fair amount of fall and winter work, but what-

ever contest is now going on is for such deliveries, and for them the market is somewhat weaker. A good deal has been said about foreign rails during the past two months, but as yet little actual business has been done. It is believed by some of those who are closely identified with the rail interest that the inability of the American mills to meet the demand for prompt delivery must favor buyers abroad. It is variously estimated that the business thus directed either to English or German mills may foot up to 25,000 to 50,000 tons, but it is generally forgotten that it takes considerable time before rails ordered in Europe are landed. We know that a number of irresponsible offers at low prices have been repeatedly made, but it appears that they possess little substance when tested. Rumors of sales in New England have been traced in that way, and a large inquiry which has been cabled to Europe within the last few days is evidently merely intended as a measure to frighten American mills into lower prices. The time is critical one, nevertheless, since it is difficult to foresee to what lengths foreign producers will go to procure business. The danger to-day does not so much lie in what may be done for fall and winter work, so far as the invasion of the foreign product is concerned, but in what the necessity for prompt shipment may force a few consumers to do. We may note in passing that, although prices at the seaboard are close, we have yet to hear of the American railroad which is willing to pay even the slightest advance for the alleged better quality of foreign rails.

Vacuum Pumps.

In view of the comparatively recent advances made in connection with pumps of the vacuum type, such as, for example, the pulsometer, the matter of economy in working pumping machinery has in many cases assumed a new aspect. It is no longer a question of steam consumption alone, but a comparison of the relative values of steam and of simplicity which claims consideration, and it is often an interesting problem to determine which of these two values is entitled to the greater share of attention. Vacuum pumps have the obvious advantages of simplicity and cheapness, but, on the other hand, even though it has been asserted that their efficiency differs but little from that of direct-acting steam pumps, it is well known that their figures for steam consumption are often, in fact, generally exceedingly high. Still, the demand for simple pumping machinery capable of handling large quantities of water will keep them in favor, and, as their builders will in time very probably find that economy may be secured without the sacrifice of simplicity, better results may be expected.

A partial remedy for the excessive waste of steam in these pumps may be found in the adoption of a lining for their iron steampipes and chambers of a metal having a comparatively low specific heat, as, for instance, lead, or of some good non-conductor. Taking lead as the lining material, the following figures, which we find in some old data on the subject, will show very strikingly what degree of saving may be effected by it. We may assume that the pump chambers are alternately heated and cooled through a range of temperature of 200°, and also that sufficient time is allowed to elapse between each stroke for the whole of the metal to pass

to probably a lower average than any experienced since 1825. These data, of course, cannot serve as absolutely exact guides—they furnish only indications corroborating the general impression that current values are below the average covering long periods.

The greater part of the past week was consumed by conferences and by preparations for them between the committee of the Amalgamated Association and the manufacturers. The former presented a scale which they claimed was substantially that of the preceding year, with the exception of one or two items. It was soon discovered by a more careful comparison that a series of advances was asked for in the finishing departments. In the past the leading issue has always been that of the wages of the puddlers, the most turbulent and obstinate class of the men. They have now learned, too late, to bow to the necessity of actual conditions, seeming to recognize that if they handicap the producers of wrought iron they will force them to turn to steel, as many of them have done. They have this year decided not to give way to the demands of some among their ranks who wanted an advance, and, as only a few of the manufacturers were in favor of insisting upon a \$4.75 rate on a 2-cent card, the old wages of \$5 for boiling on a 2-cent card rate stand intact. Originally the first scale presented by the Amalgamated Association called for 50 cents extra for boiling iron for hoops. This demand has been withdrawn, and a compromise seems to be the outcome of the discussions which are still going on as we go to press concerning the hoop and guide mill scales. A roll-turner's scale has been added, which meets with the opposition of those of the mills who have had their work done in outside machine shops at lower rates. The nail scale had not been reached at the present writing. Altogether, the differences between the men and the manufacturers are only small, after the concessions thus far made. No cardinal principles are involved, and it is likely, therefore, that no long-continued strike will be inaugurated, if there is any cessation of work at all.

A curious bit of experience has been had recently at one of the leading steel mills in the country. A lot of material for a bridge was rejected by the inspector of the buyers, much to the surprise of the producers. After the inspector had left the manufacturers decided to make an independent investigation, which resulted in showing that the rejected material did come up to specifications. Further research followed and developed the fact that for a given number of hours after the material had left the rolls its physical qualities gradually changed, reaching a period of rest only after a certain time had elapsed. So far as we know, no such observations have yet been made anywhere, and, if the facts are borne out by the experience of others, a good deal that is "mysterious" in steel may be explained.

The agitation in favor of an improvement of the Erie Canal continues, the last point being pressed before the Legislature being the granting of funds for the improvement of five locks. We print elsewhere an interesting letter addressed to the secretary of the Union for the Improvement of Canals of the State of New York, by Mr. Thomas Colden Ruggles, C. E., in which he discusses in a thorough manner a number of important questions bearing on the subject.

The Stove Founders' National Defense Association.

The most important act of the National Association of Stove Manufacturers at their recent meeting was the organization of what is to be known as the Stove Founders' National Defense Association. The object of this association is to enable manufacturers to deal with organized labor on a plane of equality; the organized manufacturers, through an executive committee, considering and acting upon any demand on the part of organized labor which cannot be settled in the foundry in which it originates. The movement is exactly in accordance with the suggestions in the articles in our issues of March 27 and May 1, in which the reasons for such organization are quite fully and specifically set forth. Very wisely, the whole matter has been taken out of the National Stove Association and put in the hands of another organization dealing only with questions involving the rights and interests of labor.

PROCEEDINGS OF MEETING TO FORM THE ASSOCIATION.

Gen. J. F. Rathbone, of Albany, N. Y., was elected chairman, and D. M. Thomas, of Elmira, N. Y., secretary. The chairman stated the object of the meeting in a lucid and forcible speech. It was unanimously resolved that an association be formed for mutual assistance and defense, to be called the Stove Founders' National Defense Association, and that those who here pledge themselves to become members shall be charter members. The proposed constitution and by-laws were read, discussed and amended clause by clause, and adopted as a whole. The following firms then signed an agreement to become members of the association:

A. Bradley & Co., Pittsburgh, Pa.
Ferry & Co., Albany, N. Y.
Cleveland Co-operative Stove Co., Cleveland, Ohio.

Duncan & Co., Sharon, Pa.
Rathbone, Sard & Co., Albany, N. Y.
Littlefield Stove Co., Albany, N. Y.
John G. Baxter Stove and Foundry Co., Louisville, Ky.
De Haven & Co., Limited, Pittsburgh, Pa.
Auschutz, Bradbery & Co., Pittsburgh, Pa.
Merion, Hertenstein & Co., Columbus, Ohio.
G. W. Gill, Columbus, Ohio.
Co-operative Foundry Co., Rochester, N. Y.
Sill Stove Works, Rochester, N. Y.
Boyle & Carey, Salem, Ohio.
Bissell & Co., Pittsburgh, Pa.
Bridgeford & Co., Louisville, Ky.
Ely & Ramsay, New York, N. Y.
March, Brownback & Co., Limerick Station, Pa.
Martin's Ferry Stove Works, Martin's Ferry, Ohio.
Ransom Stove Co., Albany, N. Y.
Cleveland Stove Co., Cleveland, Ohio.
Highland Foundry Co., Boston, Mass.
Magee Furnace Co., Boston, Mass.
Excelsior Mfg. Co., St. Louis, Mo.
Richardson & Boynton Co., New York.
Baldwin & Graham, Pittsburgh, Pa.
Lehigh Stove Mfg. Co., Lehighton, Pa.
Boynton Furnace Co., New York, N. Y.
Baxter Stove Co., Mansfield, Ohio.
Victor Stove Co., Salem, Ohio.
South Erie Iron Works, Limited, Erie, Pa.
Chicago Stove Works, Chicago, Ill.
Crea, Graham & Co., Pittsburgh, Pa.
Graff, Hugus & Co., Pittsburgh, Pa.
Collins & Burgie, Chicago, Ill.
Howe Ventilating Stove Co., Fulton, N. Y.
Kesley Stove Co., Columbia, Pa.
Great Western Stove Co., Leavenworth, Kan.

Michigan Stove Co., Detroit, Mich.
Detroit Stove Works, Detroit, Mich.
Fenner Stove Co., Detroit, Mich.
Fuller & Warren Co., Troy, N. Y.
Bloomington Stove Co., Bloomington, Ill.
Buck's Stove and Range Co., St. Louis, Mo.
Danville Stove Mfg. Co., Danville, Pa.
J. Van Wormer & Co., Albany, N. Y.
Myers, Osborn & Co., Cleveland, Ohio.
Shinnick, Woodside & Gibbons Mfg. Co., Zanesville, Ohio.
Lithgow Mfg. Co., Louisville, Ky.
A. T. Nye & Son, Marietta, Ohio.
E. Bement & Son, Lansing, Mich.
J. A. & P. E. Dutcher, Milwaukee, Wis.
Smith & Anthony Stove Co., Boston, Mass.

Brand Stove Co., Milwaukee, Wis.
Ohio Stove Co., Tiffin, Ohio.
F. & L. Kahn & Bro., Hamilton, Ohio.
Liebrandt & McDowell Stove Co., Philadelphia, Pa.
Joseph Bell & Co., Wheeling, W. Va.
Taplin, Rice & Co., Akron, Ohio.
Eugene Munsell & Co., New York, N. Y.
Cribben, Sexton & Co., Chicago, Ill.
Co-operative Stove Works, Troy, N. Y.

A large number intimated their desire to be entered as members, but had not the opportunity to sign the agreement. The following officers were then elected:

Henry Cribben, of Chicago, Ill., president.
Abram C. Mott, of Philadelphia, Pa., treasurer.
T. J. Hogan, of Troy, N. Y., vice-president.
Permanent secretary N. A. S. M., secretary.
D. M. Thomas, of Elmira, N. Y., secretary *pro tem.*

A committee of four members was appointed to nominate the district committees. Mr. Magee nominated as committee for the first district:

E. W. Anthony, of Boston, Mass.
G. W. Elliott, of Boston, Mass.
J. H. Codding, of North Dighton, Mass.
A. N. Parlin, of Boston, Mass.
W. C. Higgins, of Norwich, Conn.

Mr. John S. Perry nominated as committee of second district:

Grange Sard, of Albany, N. Y.
C. A. McLeod, of Troy, N. Y.
N. A. Boynton, of New York City.
C. L. McDowell, of Philadelphia, Pa.
E. W. Peck, of Rochester, N. Y.

Mr. R. P. Myers nominated as committee of third district:

Jeremiah Dwyer, of Detroit, Mich.
W. W. Baldwin, of Cleveland, Ohio.
Joseph Bell, of Wheeling, W. Va.
J. W. Van Cleave, of Louisville, Ky.
A. J. Redway, of Cincinnati, Ohio.

Mr. C. L. Filley nominated as committee of fourth district:

C. E. Collins, of Chicago, Ill.
H. A. Dutcher, of Milwaukee, Wis.
H. M. Burt, of Leavenworth, Kan.
C. H. Castle, of Quincy, Ill.
C. H. Filley, of St. Louis, Mo.

The committees as nominated were elected. It was unanimously resolved that all persons notifying the secretary on or before the 15th of June of their willingness to become members of this association shall be charter members. It was resolved that any person having signed the agreement to become a member should be at liberty to withdraw notification to the secretary before the 15th of June. It was resolved that no action should be taken upon any question or strike existing at the present time.

Several emendations of and additions to the constitution and by-laws having been proposed and discussed, it was resolved that the secretary be empowered to amend the wording thereof and add such matter as had been discussed and adopted in principle. The meeting then adjourned.

D. M. Thomas, Secretary.

It is unnecessary at this time to give the constitution and by-laws, which simply provide for the organization of the association and the orderly conduct of its business. The four districts having committees are as follows:

First district, the New England States.
Second district, New York, New Jersey, Pennsylvania east of the Alleghenies, Maryland and Virginia.
Third district, Pennsylvania west of the Alleghenies, Ohio, Michigan, Indiana, Kentucky, Tennessee and West Virginia.

Fourth district, Illinois, Missouri, Kansas, Wisconsin, Minnesota and all west of the Mississippi.

The object provided for in the constitution and by-laws is the protection of concerns in the membership against demands inconsistent with the best interests of the trade. When the district committee is called in it assumes full authority to grant or refuse the demands of labor, and its decision is sustained by all the firms in the membership.

PRACTICAL WORKINGS OF THE DEFENSE ASSOCIATION.

The scheme adopted at Cleveland was the wisest which could be adopted. Organization by districts is the only practicable method. Strictly local associations would be much less effective than those operating upon broader scale. Each district has its executive committee, to which concerns in the membership will refer all questions relating to labor which cannot be amicably adjusted in the foundries in which they originate. Complaints of grievances, demands for increased wages or shorter hours of labor, union rules, &c., will be considered by the committee fairly and impartially, a hearing probably being given to those representing the workingmen when conference is desired. If the demands of labor are found reasonable and proper, the committee will so decide; and if the manufacturer by whom the complaints are refused shall refuse to be governed by the decision of the committee, a meeting of the General Executive Committee of the National Association may be called to hear and decide the appeal. If the judgment of the district committee is sustained, the manufacturer having an issue with his labor must concede what is demanded or settle the matter with his men without further help from the association, thus availing himself of his undisputed right to take the matter into his own hands. If, on the other hand, the committee find the demands of labor unreasonable and improper, they will authorize the member calling them together to refuse compliance, and to notify his men that in such refusal he is sustained by the Stove Founders' National Defense Association. Should his men go out on strike, other manufacturers in the association will take his patterns and manufacture for him during the time his foundry is idle. An issue will thus be contested and settled in the foundry in which it originates, and it is scarcely probable that under such circumstances labor will be long in deciding that an unjust contest is hopeless. This in rough outline indicates the object, organization and operation of the association. That it is perfectly practicable is shown by the fact that in some lines of trades such organizations are already in successful operation. The manufacturers of brass goods are thus organized, and since putting an end to the strike in progress when their association was first formed, they have had no important labor questions to deal with. In certain districts cotton and woolen manufacturers have employers' organizations, and find them of the greatest value as a protection against unnecessary and ill-advised strikes or unreasonable demands. The tendency in many trades seems to be in this direction, and the stove manufacturers are wise in availing themselves of measures of self-protection which have been tested and found efficacious, and which common sense approves.

NO OPPRESSION OF LABOR TO BE FEARED.

That the thorough organization of employers in district associations will be productive of marked benefits to the wage-earner, need not for a moment be doubted. Some of these benefits we have already outlined. Others will readily suggest themselves to the thoughtful student of labor problems. Employers as the rule have no wish to oppress labor, nor to deal unjustly with it in anything. At the hands of a committee representing many manufacturers injustice and oppression would be impossible. It is to the manufacturer's interest that labor should be contented and prosperous, and that good men should earn good wages. We know better than they how destructive of their true welfare are strikes and lockouts. We also know that strikes seldom originate in deliberate consideration, and are rarely approved by a majority of those who go out. By placing a wholesome restraint upon the facility with which unions can be controlled, to the disadvantage of industrious men, by demagogues who live by stirring up strife, thoughtful workmen can be taught the substantial advantage of uninterrupted industry. Through organization the manufacturers can place themselves in a position in which they can be generous as well as just to labor, and who will deny that this is their desire?

As the result of organization among employers we look for the growth of a better feeling between them and their workmen than now exists—a closer sympathy, a better mutual understanding and a greater respect and consideration. These cannot be secured if employers in any way use unfairly or oppressively the power which organization will give them. Labor will learn what it does not now know, or knowing does not appreciate, that between employers and men there exists a natural bond of sympathy born of mutual dependence. When they have learned this we may expect that labor will profit by the time-honored fable of the contest between the storm and the sunshine as to which should soonest strip the traveler of his cloak. The traveler may be held to typify capital and his cloak selfishness. The

fiercer the storm the closer will capital wind its cloak about it. But if the storm clouds of passion and prejudice are dispelled and the genial sunshine of good-will and confidence warms the atmosphere, the cloak will be thrown aside. We heartily congratulate the trade upon the organization of the National Defense Association, the most profitable outgrowth of the National Stove Association during the 14 years of its existence.

Obituary.

DAVID VAN NOSTRAND.

David Van Nostrand, the well-known publisher of scientific books and importer of foreign works, died at his residence in this city on Monday afternoon, June 14. He had been unable to attend to his business for a year past, and his health began to fail four or five years ago. Mr. Van Nostrand was born in this city in December, 1811. In 1826 he entered the bookstore of John P. Haven, at John street and Broadway, where he remained eight years. He then associated himself with William B. Dwight. The partnership was dissolved in 1837, and Mr. Van Nostrand was afterward employed for some time by Gen. J. G. Barnard, then directing the construction of the fortifications at New Orleans. Mr. Van Nostrand's tastes were literary and scientific, and his contact with military and professional men gave him the opportunity to indulge them. So many gave him orders for books, relying upon his good judgment for their selection, that he found the matter growing on his hands. He opened a store at Broadway and John street, opposite to that in which he had been first employed. During the war his military publications were numerous. After his close of his specialties were scientific and foreign books. In 1869 he removed his business to its present location in Murray street.

CHARLES DENNIS.

Charles Dennis, vice-president of the Atlantic Mutual, and one of the most experienced marine underwriters in New York, died at his residence in Brooklyn on Tuesday.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 15, 1886.

The opposition to the Morrison bill have been in conference and have outlined their course. The first proposition is to antagonize the motion to go into committee of the whole on Thursday by a motion to lay the motion on the table. Should the latter motion not prevail and the House go into committee of the whole, the second step will be resorted to, *viz.*, a motion to strike out the enacting clause. The success of this will depend largely upon the time it is offered. The motion to go into committee of the whole will indicate a disposition to discuss the bill. In that case a motion to strike out would naturally be delayed until discussion was over and action on the bill was reached. Some are disposed to take the vote on consumption of one portion, leaving the remainder to go under general order as unclaimed. The whole invoice must be entered; one portion thereof may be entered for consumption and the other for warehouse.

Mr. Randall said to the correspondent of *The Iron Age*: "I shall not interpose any bill for the purpose of preventing action on Mr. Morrison's motion to go into committee of the whole. If he desires at this late period in the session to enter into such a controversy he is welcome to try it. I can hardly believe that a majority of the House will support such a motion. There has been so much anxiety and uncertainty as to the probabilities of this bill that I think, in justice to the business interests of the country, it should have a fair test. If the debate should begin it will last at least a month. In its present shape there is no doubt about its defeat, but I cannot say what might happen in event of material modification. In my opinion it would do more harm than good to pass anything but a carefully prepared bill framed with reference to American industry and the interests of labor."

The President has been taking an active interest in the tariff question. He has had talks with several of the protection Democrats, including Mr. McAdoo, of New Jersey, and has urged them to see the importance of not adjourning until some action shall have been taken upon the tariff, if not in the line of specific legislation, at least in the enunciation of some general principle of tariff revision which will meet the expectations of the people and carry out the pledges of the Democratic party as set forth in their platform of 1884. Mr. Randall concedes that the President is in earnest in his desire to have some authorized expression of the House on tariff revision, so that the Congressional campaign, so far as the Democratic party is concerned, may go before the country claiming that the pledges of tariff revision made by both parties have been undertaken in the line of execution by one and defeated by the other. The protection Democrats regret the President's attitude in this matter, as they have no desire to antagonize him, but their ideas of what constitutes tariff revision from the standpoint of pro-British or American doctrine may differ. When it comes to that they admit that the line will be drawn, as they are compelled to act in the interests of their constituents first, no matter what may be the result in other directions.

AMENDMENT OF TRANSPORTATION STATUTES.

The Committees on Ways and Means have reported an amendment to the act of 1880, in relation to the immediate transportation of dutiable goods, which is intended to facilitate the entry and transit of imports under

the metal and other schedules where specific duties are levied. The amendment allows the merchandise liable to specific rates of duty only to be entered for immediate transportation without appraisement to any of the ports mentioned in the act of 1880, although the same may not appear by the invoice of the importing vessel to be consigned to or destined for either of the said ports, when the consignee at the port of first arrival shall make written application therefor to the collector. The privileges of the act can be granted only in cases where no part of the merchandise shall have been landed prior to entry for immediate transportation.

RECENT CUSTOMS DECISIONS.

The carton decision by the Supreme Court of the United States is being utilized by importers as a basis of all sorts of claims and appeals, with a view to evading duties by strained constructions of the law. The Acting Secretary of the Treasury has instructed the collector at New York that "cartons, coverings, &c., of imported merchandise, under the late decision, are either exempt from duty as coverings or charges or are liable to a duty of 100 per cent. ad valorem, under the act of 1883, which prescribes that 'if any packages, sacks, crates, boxes or coverings of any kind shall be of any material or form designed to evade duties thereon, or designed for use otherwise than in the *bona fide* transportation of goods to the United States, the same shall be subject to duty of 100 per centum ad valorem upon the actual value of the same.' The appraiser should report the dutiable value of the goods *per se* and the value of the charges separately, leaving to the collector the determination of the question as to whether the coverings are liable to duty under the existing laws or not."

Merchandise imported into a United States port in the same vessel in which it was originally shipped at the foreign port, and which vessel was stranded during the voyage, and was afterward raised and brought with some of its cargo to the port of destination, is not entitled to entry by appraisement as goods saved from a wreck, under Section 2028, Revised Statutes.

An invoice of merchandise consisting of several packages transported to an interior port cannot be divided so as to allow an entry for consumption of one portion, leaving the remainder to go under general order as unclaimed. The whole invoice must be entered; one portion thereof may be entered for consumption and the other for warehouse.

Paper Rails in Russia.

In the *Gentleman's Magazine*, and regarding the projected establishment of works near St. Petersburg for the manufacture of paper rails, Prof. Mattieu Williams says:

We are told by the *Organ des Mines* that these can be produced at one-third the cost of steel rails, and that they are extremely durable, the paper being condensed by great pressure. Being much lighter than metal, these rails may be carried and laid at far less cost. They are to be made in greater lengths than ordinary rails, and, therefore, will have fewer joints. This will doubtless diminish oscillation and the consequent wear and tear of rolling stock. The success or failure of the project is simply a question of durability, and I doubt whether anybody can make any prediction better than mere random guessing concerning this. Many will, of course, laugh at the idea as obviously absurd, but all great innovations are obviously absurd to those who do not understand them. In reference to this we must remember that much of the wear and tear of our rails is due to the crushing weight of the engine, and this cannot be diminished with metal rails, for if the engines were made lighter the grip of the driving-wheels would fail. The paper will doubtless afford a far better adhesion, and thus be less violently treated, and effect a saving in the plant. It is not a question of wear, but of crushing. When there is no slipping of driving wheels, nothing but rolling pressure, there can be little or no wear of surface. The only doubtful question, as it appears to me, is whether the compressed paper will disintegrate internally under the action of repeated crushing strain, and thus bulge out sideways. The tenacity of paper is much greater than is commonly supposed. The prevailing ideas on the subject are due to the fact that we usually have it before us in films that are easily torn by a cross strain. A sheet of iron equally thin is similarly tearable. If we try to break a piece of paper by a fair, straight pull its great tenacity becomes evident. Count Rumford made a bar of paper by gluing strips of ordinary sheets together. He found that such a bar having a sectional area of 1 inch sustained a weight of 15 tons. This is a near approach to the tenacity of wrought iron. The Admiralty test for ship plates is 22 tons in the directions of fiber, and 18 tons across for first-class and 20 and 17 tons for second-class iron. We must all be well-wishers for the success of this invention, as the luxury of gliding over noiseless tracks would

THE WEEK.

P. D. Davis, master workman of the Knights of Labor and a leader in the late Southwestern strike, was sentenced to two years in the State penitentiary and fined \$500 in the Circuit Court at Union, Mo., last week. The crime alleged was attempting to wreck a freight train and shooting at the guards.

Referring to the passage of the Kill von Kull Bridge bill by Congress, Erastus Wiman says the Baltimore and Ohio people expect to begin the work of construction within 90 days; that an extensive shore front will become available for commercial purposes; large warehouses will be erected, and an important development of manufacturing enterprise on Staten Island is assured.

Business on the Erie Canal is much more active and remunerative than it was a year ago.

Scales capable of weighing 150 tons at once, or a dozen loaded coal cars, are in use by the Reading Railroad. One is being constructed 123 feet in length.

Raw silk to the value of \$5,563,000 was imported at San Francisco this year up to May 1 on Eastern account. The total imports for that period were \$14,728,150; exports, \$12,034,254.

Newark manufacturers, embarrassed by numerous boycotts since the conspiracy laws were repealed in 1882, will petition the Legislature, through the Board of Trade, that the laws be re-enacted.

A contract has been awarded to the Canton Iron Bridge Co. by the Somerset County, N. J., freeholders for a bridge across the Raritan River at Raritan, at a cost of \$7000.

The petition of the Pennsylvania Steel Co. against the Philadelphia and Reading Railroad Co., setting out that the latter is indebted to it in the sum of \$226,679.29 for rails and supplies furnished during March and April, 1884, and asking to be allowed to intervene as a party plaintiff in the Kelsey suit, was last week presented in the United States Circuit Court and referred to Special Master Dallas to take testimony and report. The petition asks that the claim be determined to be a prior lien to the mortgages and fixed charges of the road, as the material supplied was used under the receivership and was necessary for the maintenance of Reading's property.

The torpedo in use by the United States steamer Haze, on Lake Erie, is of the fish variety, and propelled by an engine inside, steam at a pressure of 1000 pounds per square inch being furnished by the generator. The finny monster carries 70 pounds of gunpowder and other explosives, and is constructed to dive and continue straight on its course until it strikes its object. Its weight is 800 pounds.

Secretary Bayard gives assurances that the fishery question is receiving earnest attention, but negotiations are necessarily slow. He "cannot for a moment think of receding in any degree from the position the United States Government has taken in the matter, and believes we shall succeed in establishing the justice of our cause so fully and completely that the British Government will accede to all we claim." He deprecates the disposition of some of the Eastern fishermen to take the law into their own hands by arming themselves.

San Francisco is growing faster than the State, notwithstanding new rivals of more or less importance have sprung up within a few years in Sacramento, Los Angeles, San Diego, San Jose, Stockton, Portland and even the leading towns of British Columbia and Washington. Most of the trade of the Pacific Coast is carried on with the East, and the merchants and manufacturers of the East are enabled to supply the interior as advantageously in a measure as is San Francisco. The lowering of railroad freights by the freight war works with peculiar hardship to San Francisco. Rates have been lowered to all interior cities and lowered from the East, but from San Francisco to these same points they are ironclad. Despite rival ports and railroad discrimination the growth of San Francisco compared with the rest of the State for a series of years appears from the following:

	Population, State.	Population, City.
1860.....	279,464	55,000
1870.....	589,477	149,473
1880.....	864,694	283,959

The Shoe and Leather Association of Lynn, Mass., last week voted for the appointment of sub-committees to prepare new lists of wages in each department, covering all prices in making shoes. This is a surprise to the Knights of Labor, as "it shows a disposition on the part of the manufacturers to take control of affairs, without regard to previous relations."

The Nicaragua Ship Canal scheme is up again in a new shape. In the Senate on Friday Mr. Edmunds introduced a bill to incorporate the Maritime Canal Co. of Nicaragua, to construct and operate a ship canal via Lake Nicaragua and the River San Juan. The principal office of the company is to be in New York City, and the capital stock is to be not less than 500,000 nor more than 1,000,000 shares of \$100 each. The aggregate of all charges, dues and tollage collected by the company for the trans-

portation of vessels through the canal is not to exceed the rate of \$2.50 gold coin per ton or per 40 cubic feet measurement, but the company may at its option charge in lieu thereof not exceeding \$1.25 per ton actual displacement of any steam vessel or \$1.75 per ton of the actual displacement of any sailing vessel passing through the canal. The United States shall exercise such control over the canal as is now or may at any time be provided for by treaty with Nicaragua, and shall, upon payment of one half of the customary rates, enjoy unobstructed use of the canal for the transportation of troops, munitions of war and mails. The incorporators are Frederick Billings, Charles F. Daly, H. L. Hotchkiss, Francis A. Stout, Daniel Ammen, Wm. L. Merry, Homer Davis, Edward F. Beale, Jas. H. McMullin and Shepherd Homans.

Quong Wo, a graduate of Yale College, left New York a few days ago in the interest of the Chinese Six Companies of San Francisco, to complete arrangements for the colonization of about 10,000 of his countrymen in Peru. Conversing with a reporter, he said: "The Government at home favors the project, and it is probable that it will bear a considerable portion of the expense. Peru and Chili are the objective points. The Six Companies, you must know, are powerful and wealthy bodies. Their interests in this country, as well as the interest of our Government, make it imperative that the friendly commercial relations between this Government and ours shall not be broken or strained, as they promise to be by the complications constantly arising from the presence of so large a number of my countrymen on the western slope. A way out of the difficulty is now presented. The climate of Northern Chili and Peru is a good one for our people. The soil is rich, but undeveloped, and capable of producing heavily. The whites of that country will not do manual labor, and the natives are naturally a commercial people, and would rather trade and peddle in a small way than anything else. A Chinese colony will be planted where they can engage in farming and manufacturing. Both Governments look favorably upon the scheme, and it is probable that the first installment will be sent down in November next, when as many of them as wish it will find employment on the railroad now being built by Americans."

The first California barley this season was received in San Francisco on the 2d inst. At that date harvest was going on rapidly in the West and South. The crop is estimated at over 18,500,000 cents.

The completion of the Pacific Railroad from Buenos Ayres to Quinto is an event of the highest importance to the Argentine Republic, as it places Buenos Ayres in direct and immediate contact with the Andes. The final section now awaits the approval of the Government.

The South American mail brings us President Roca's message to the Argentine Congress, in the course of which he sketches the material progress of the country. He says: "We have annexed vast Indian territories north and south, which will soon form nine new provinces in the confederation. Their importance will soon appear owing to the new Cape Virgin gold fields in the Santa Cruz district. In 1880 our imports and exports summed up \$103,000,000, and last year reached \$189,000,000. The revenue of the Republic is now \$39,000,000, against \$20,000,000 in 1880. Tonnage between entries and sailings is now 3,350,000, against 1,050,000 in 1880. We have now 4,800,000 acres under tillage, against 2,700,000 in 1880. Immigration has likewise risen from 32,000 to 108,000 persons. Our cattle have multiplied and covered the pampas, the Gran Chaco, the Rio Negro, the slopes of the Andes, and are now sweeping down to Chubut and Magellan's Straits. We shall soon be the foremost cattle country in the world. The banks had assets equal to \$200,000,000 in 1884, which increased 50 per cent in one year, being now \$300,000,000. Since 1880 the new railways, State and private, sum up a length of 2500 miles." From the foregoing it is not difficult to account for the absorption of many millions sterling of English capital borrowed for investment.

Enormous barns are being erected in Colorado for the protection of cattle from storms, which last winter destroyed entire herds, so that railway trains after passing through cuts where these animals had taken refuge sometimes looked as though they had been in a slaughter house. Fully 100,000 cattle are entering Colorado from Texas to escape the drought.

The New York State Forestry Commission appointed last autumn are about to organize for service by appointing a force of guardians in the Adirondack wilderness and in other forest clad regions of the state. There will be a fire warden in every township in the 14 counties in which the State forest lands are situated. Besides these they will commission the supervisor of every town in the State as a special fire warden. These men will see that the woods belonging to citizens are not destroyed. In all there will be 1000 fire wardens to protect the forests from destruction by fire. Wm. P. Fox is secretary of the Commission.

The British Post Office Department has notified the steamship companies in the Transatlantic trade that the existing con-

tracts for the American mail service will not be renewed after their expiration on December 1. The new arrangement announced provides for a monthly or quarterly arrangement with the most efficient vessels, and payments per voyage on a basis of the actual amount of mail matter carried. This action on the part of the British Government, by which preference is given to the first and fastest steamers, is regarded in Washington as a complete vindication of the policy of Postmaster-General Villas in this respect.

The sugar crop of Louisiana this season is estimated by the New Orleans Picayune at 15 per cent. less than the yield of last season, which was 220,000 hogsheads. Advises from St. Thomas, of May 28, say that the sugar crop of Barbados was estimated 25 per cent. less than the last crop.

Another large storage elevator is about to be erected in Philadelphia by the Pennsylvania Railroad Co., and two more in Buffalo.

It is authoritatively stated at Halifax that the British Government has issued orders to make no more seizures of American vessels except when the violation of the treaty of 1818 is so open and flagrant that it cannot be winked at.

Edward A. Boyd, of Edward A. Boyd & Sons, plate-glass importers, died at his residence at High Bridge on Friday last, of consumption. His disputes with the Government, owing to alleged fraudulent importations, lately occupied the attention of the courts. The deceased was in his 65th year.

The recently discovered oil fields near the Red Sea have been examined by a Belgian engineer, who found a copious flow of petroleum after boring about 150 feet.

Among the wonderful products of art in the French Crystal Palace was shown a lock which admitted of 3,647,385 combinations. Heuret passed 120 nights in locking it. Fichet was four months in unlocking it; afterward they could neither shut nor open it.

President Cleveland has accepted the honorary presidency of the American Exhibition to take place in London in May, 1887, and will start the machinery by the telegraph land lines and the cables.

Brazilian trade is unusually depressed. Money is scarce and foreign trade, especially the exports, is diminishing, the returns for April showing a large falling off.

A difficult wrecking job was successfully accomplished by Capt. S. A. Murphy, of Detroit, by raising from a depth of 125 feet the Canadian propeller Quebec, sunk nearly a year ago, and taking her into Collingwood Harbor.

Since the completion of the New York, Philadelphia and Norfolk Railroad there has been sharp competition between that company and the four steamship companies carrying freight between Northern and Eastern points and Norfolk and Portsmouth, Va. These lines are the Baltimore Steam Packet Co., the Old Dominion Steamship Co., Clyde's Lines, doing business from Philadelphia, and the Merchants' and Miners' Transportation Co., doing business from Boston and New England points. It is understood that these companies have arranged to pool their earnings.

H. M. Morrison, one of the largest manufacturers of machinery in Glasgow, has decided to come to the United States and erect extensive works either in Pittsburgh or Philadelphia. His specialty is machinery for hauling in mines. He says: "One of the chief reasons for our coming here and going into business is that Americans have a feeling of distrust of manufacturers who are not on the ground, as it were. We will also be able to make a great saving in the matter of cost of production of machinery intended for the American market. My calculation is that, notwithstanding the higher price we will have to pay for labor here, we will be able to effect a saving of at least 35 per cent. This is a great inducement, and when we see the vast field that is open to us I do not think there is much likelihood of our neglecting to avail ourselves of the opportunity."

Traffic through the St. Mary's Ship Canal, the gateway of Lake Superior, was larger last month than in any previous month in its history. Upward of 900 vessels of all classes passed through the locks, comprising 606 steamers, the whole representing 550,065 tons registered and 529,793 tons of weight. The registered tonnage exceeded that of any other month by 19,276 tons, while the freight tonnage was only 24,068 tons less than that of the largest known, and was twice as great as for May of last year.

An exhaustive report on the cotton acreage of the United States, prepared by the Commercial and Financial Chronicle, gives results showing an estimated acreage of 18,994,000 for 1886, compared with 18,710,000 acres last year. The condition of the plant is ascertained to be generally less favorable than a year ago.

Capitalists in Brooklyn are at last convinced that there is money in elevated railroads. The Union L. Road Co. is the name of a new organization with a capital stock of \$1,000,000, which was immediately taken by a syndicate when the books were opened at the Fulton Bank, a week ago. The amount of \$50,000 in gold, or 5 per

cent., was deposited at sight before others present had the opportunity to obtain a share. It is observed that most of the subscribers are already interested in the Brooklyn Elevated Railroad, who will be enabled to carry out their original gridiron scheme should the new enterprise surmount all objections.

Another business firm, that of Brennan & White, formerly prosperous shoe manufacturers, have been boycotted out of existence. Their factory in Williamsburgh is closed and about 200 persons are thrown out of employment.

Commissioner Peck, of the Bureau of Statistics of Labor, proposes to investigate extensively the subject of strikes and boycotts, their causes and results as affecting employer and employee. He expects to learn particularly respecting the Third Avenue Railroad strike and the losses to each of the parties to the controversy. Circulars asking for information have been issued. To employers 41 questions are addressed and to labor unions 55. The law prescribes a penalty where information is withheld.

A ferry company with a capital of \$400,000 has been formed to run boats from Pier 2, East River, to South Brooklyn. R. M. Hoe and R. Fulton Cutting are among the trustees.

The cadets at West Point on graduation day were exercised in pontoon bridge building. At a given signal the work began, and in 24 minutes a loaded army wagon was driven safely over the structure at a quick trot. The canvas pontoon and bridge equipment were exhibited to the Board of Visitors by Captain Price and his assistants from the corps of engineers.

An enormous scheme is occasionally hinted at as in process of incubation which contemplates a joint traffic arrangement between the Pennsylvania and New York Central Railroads at Jersey City. To effect this object the Hudson River Tunnel will be finished and a short line be built from Bayonne, N. J., to the terminus of the West Shore at Weehawken.

There were no bondholders of national debts in old times. Kings and princes only considered the division of spoils. Now they are compelled to hesitate before destroying a weak power, because their subjects are its creditors. Thus a nondescript Government like that of Egypt is maintained as a commercial speculation by a power like Great Britain, not for the sake of preserving Egypt as an integral part of the Turkish Empire, but solely for the purpose of running a machine which will from year to year realize money for creditors.

The returns of the foreign trade of India during the past financial year, just published, show a trifling increase on the trade of the preceding year, but a considerable decline as compared with the trade of 1883-84. The exports of merchandise during the year were of the value of 8380 lakhs of rupees, against 8330 in 1884-85, and 8812 in 1883-84. The imports of merchandise were of the value of 5565 lakhs, against 5570 in 1884-85, and 5527 in 1883-84. These figures do not include treasure or Government stores.

Inferentially the progress made in steamboat building is indicated by reference to a description given by the Boston Journal in 1826 of the steamer Washington, built in that year for the Providence and New York Steamboat Co. She was 160 feet long, 32 feet beam and 10 feet hold. She was a "floating palace," and the editor was pleased to observe further respecting her: "What further improvements yet remain to be made in steamboats we can't imagine."

The valuations on property in the upper wards in this city have been increased by the city assessors to an aggregate probably of \$5,000,000 over the figures for last year. In some cases the valuation on vacant lots has been increased from \$250 to \$450, particularly in those neighborhoods where building is being extensively carried on.

Philadelphia, like New York, gives the preference to Belgian block pavements, appropriating \$80,000 more for this purpose.

The most serious question Professor Hadley now has under consideration is one furnished by the last General Assembly. It is the employment of women and children in factories of various sorts. The inquiries made are designed to determine the number of women and children employed, the age of the latter, the hours of work in summer and winter, the class of work and the dates of payment. To this inquiry there has been a very ready response, and several hundred manufacturers have given full details, with occasional voluntary statements which are helpful. At the same time with the circular about women and children was sent one in relation to factorizing of wages. The commissioner asks not only the number of cases of factorizing during 1885, but how far, in the opinion of manufacturers, wages should be exempt from attachment.

Recent contradictory reports respecting the intended movements of Mr. Winston, lately United States minister to Persia, are supplemented by a dispatch from St. Petersburg which says he will soon be in that city to arrange for the construction of a line of railway from Teheran to the Afghan frontier under a 20-years' contract guaranteed by the Shah, "to develop all the riches of Persia."

Roswell P. Flower, president of the Electrical Subway Commissioners, has returned from a tour of inspection in different cities, and is convinced not only of the practicability, but desirability, of putting all wires underground. The cost of maintaining wires under the new system is materially reduced.

A syndicate representing Philadelphia capitalists assume the ownership of the Broadway and Seventh Avenue Railroad. The new board elected Henry Thompson, of the Metropolitan or "gridiron" road, president.

Traffic on the Brooklyn Bridge for the year ending May 31 comprised 25,000,000 passengers, and yielded in receipts \$680,466, of which \$600,000 were from the railroad. The expenditures, including betterments, were \$550,600.

Within the last six weeks an enormous quantity of grain has been carried over the lakes for immediate exports, and now freight rates by vessel from Chicago are much lower.

Over 650,000 tons of Lake Superior iron ore have been shipped from Detroit since the opening of navigation, doubling the amount forwarded last year up to a corresponding date, and predictions are made that the aggregate shipments of the season will reach 3,000,000 tons.

The Manual Training School in St. Louis last week had 45 graduates whose skill in the manufacture of tools and machinery elicited much praise. A local editor says: "The lads looked well in their mechanics' attire, and worked with both energy and ability. The work turned out was well finished and without a flaw. Plaster moldings and blacksmiths' and manufacturers' tools were the principal features. The work of the third-year boys was considered by far the best ever executed in the school. Practical mechanics who were present frankly admitted that men in their shops never finished work to such a degree of perfection, only qualifying their praise by the remark that they had not sufficient time to do so. However that may be, the work of the manual school machine shops as shown defies competition, much of the iron and steel having a polish equal to high-class electro-plate."

Russell Sage, ex-Judge Hilton and others have organized the Gas Consumers' Co., and propose to charge only \$1 per 1000 feet.

Ex-Senator Windom, of Minnesota, who is interested in Mexican railroads and has just returned from that country, expresses satisfaction that his investments in that direction are no larger, as the promised subsidies by the Government cannot be relied upon. He thinks mining enterprise in Mexico is much more attractive.

The Government contract for supplying stamped envelopes and newspaper wrappers for the four years beginning October 1, 1886, was awarded to the Morgan Envelope Co., of Springfield, Mass., and the Plimpton Mfg. Co., of Hartford, Conn. A large reduction in prices will be secured under the new contract, amounting to nearly \$1,000,000, as compared with the prices under the present contract.

Paper manufacturers are preparing their annual inventories, after a six months' business on very narrow margins. They represent that the price of paper has been going down at the rate of $\frac{1}{4}$ and $\frac{1}{2}$ cent a pound for the last six years, until it has reached bed-rock, and the margin for profit is now exceeding narrow. Meanwhile the cost of production has not been correspondingly reduced.

Technical education in Europe is to be stimulated through the efforts of a convention of its friends, to be held in Bordeaux, France, September 20. The convention will consider all plans and schemes and lay down the foundations for a thorough international organization. Germany is forging to the front as a manufacturing nation, and France feels that she must plunge into the stream of progress or be left.

The contract for mounting the great Lick telescope at Mount Hamilton Observatory has been awarded to Warner & Swasey, of Cleveland, for \$42,000. All celebrated foreign makers competed except Repsolds, of Hamburg. The objective is 36 inches and the telescope is to be 57 feet long, with a diameter of tube of 42 inches. It is expected that the telescope will be mounted by next July. The total cost of the dome and telescope will be \$170,000.

Captain Lyle

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Trade Report.

New York.

American Pig.—This market is exceedingly quiet, current sales having dropped to an insignificant amount. At this season of the year there is generally some business for summer deliveries. This, however, is almost entirely absent so far, and the market is therefore duller than usual. Much is not expected in June or early in July, the heavy buying beginning usually with the first of August, but even the little current trade in June seems to be missing. What uneasiness does exist in the minds of producers of Pig Iron does not refer to the present, where evidently a very large production is being absorbed by past contracts, but the lack of any inquiries for the future troubles them. We quote for standard brands, tidewater delivery, \$18 @ \$18.50 for No. 1 X Foundry, \$17 @ \$17.50 for No. 2 X Foundry, and \$16 @ \$16.50 for Gray Forge, with the market in buyers' favor. Outside brands are 50¢ below these quotations.

Scotch Pig.—The arrivals are very light, and business is confined to a very small jobbing trade. We quote nominally as follows for small lots: Coltness, \$20 @ \$20.25 to arrive; Gartsherrie, \$19.25 @ \$19.50 to arrive; Shotts and Langloan, \$20 @ \$20.50 to arrive; Carnbroe and Glengarnock, \$19 @ \$19.25 to arrive; Summerlee, \$19.75 @ \$20 to arrive; Dalmellington, \$18.75 @ \$19 to arrive; Eglinton, \$18 to arrive, and Clyde, \$18.50 @ \$19 to arrive.

Bessemer Pig.—We hear of liberal offerings of Bessemer Pig from Western Pennsylvania at prices at furnace too high to compete with Eastern furnaces. We continue to quote Foreign nominally \$18.75 @ \$19, and Domestic \$18 @ \$18.50 at furnace.

Spiegeleisen.—Not a single transaction is reported. We quote nominally 20¢ English \$25.25 @ \$25.50.

Bar Iron.—The market continues quiet, with no indications pointing to an immediate improvement. Some of the mills sell little in this market, being able to realize better prices nearer home. We continue to quote for delivery here in round lots: Common Iron, 1.65¢ @ 1.70¢; Medium, 1.70¢ @ 1.75¢, and Refined Iron, 1.75¢ @ 1.9¢. Store prices are 1.75¢ @ 1.80¢ for Common, 1.85¢ @ 1.90¢ for Medium, and 1.9¢ @ 2.2¢ for Refined.

Structural Iron and Steel.—The Harlem River Bridge contract appears to be going through a series of peculiar phases. It has not yet been awarded. We quote for Angles 2¢ @ 2.10¢, delivered, and Tees at 2.40¢ @ 2.45¢, for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.25¢ @ 2.4¢ for Angles, and 2.6¢ @ 2.7¢ for Tees. American Beams and Channels are nominally 3¢ base from dock for all orders.

Plates.—We quote for round lots: Common or Tank, 2.12½¢ @ 2.20¢; Refined, 2.45¢ @ 2.55¢; Shell, 2.45¢ @ 2.55¢; Flange, 3.45¢ @ 3.55¢; Extra Flange, 4¢ @ 4.5¢. For small lots of Steel Plates the quotations are as follows: Tank, 2.70¢ @ 2.75¢; Ship, 3¢; Tees at 2.40¢ @ 2.45¢, for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.25¢ @ 2.4¢ for Angles, and 2.6¢ @ 2.7¢ for Tees. American Beams and Channels are nominally 3¢ base from dock for all orders.

Plates.—Business in this department continues slow, except in specialties, on which most of the mills are more or less engaged. The demand from large consumers has been very disappointing, and without Skelp and other articles some of the mills would have been compelled to shut down. As it is, they are all able to run tolerably full, although at unsatisfactory prices, which as yet show no signs of improvement. Best Refined Bars nominally 1.85¢, but 1.8¢ is a general quotation, and less than that in some cases. Good medium qualities of Bars 1.75¢ @ 1.75¢, and Skelp 1.82½¢ @ 1.87½¢, with large sales at 1.82½¢ @ 1.85¢.

Plate and Tank Iron.—The market is very quiet, and orders for Plates cannot be had in anything like reasonable sized lots, unless by shading prices. Even though the demand is not large, but as many of the mills are running short of work they are all anxious to secure a share of what may be offered. Prices about as follows: Ordinary Plate, 2.05¢ @ 2.10¢; Tank, 2.1¢ @ 2.2¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4.5¢.

Structural Iron.—A little better demand is reported for small lots, but nothing that will give the mills more than two or three weeks' work. Large orders appear to be very scarce at present, although manufacturers are hopeful that after midsummer a good deal of work will come out. Prices are rather easier, and on good-sized lots Plates and Angles can be shaded. The usual quotations are as follows: 2¢ @ 2.05¢, delivered, for Angles; 2.1¢ @ 2.2¢ for Bridge Plate; 2.4¢ @ 2.5¢ for Tees, and 3¢ for Beams and Channels.

Scrap.—The market is quiet at \$18.25 @ \$18.50. There is comparatively little Scrap in yard in this market, and much of it is held above our quotations.

Rail Fastenings.—We quote Spikes, 2.20¢ @ 2.40¢; Angie Fish Bars, 1.75¢ @ 2¢; Bolts and Hexagon Nuts, 2.8¢ @ 3¢.

Philadelphia.

Office of The Iron Age, 260 South Fourth St., Philadelphia, June 15, 1886.

Pig Iron.—The market, although very quiet, shows a better tone and is generally thought to indicate improvement at an early date. Outside brands and inferior grades are plentiful and can be had at low figures,

but when standard or special brands are required there is no surplus, and pretty full prices have to be paid. Under these conditions the market is irregular and uneven, having an appearance of strength or weakness just according to the article offered or desired. There is undoubtedly an increasing supply of low-grade Irons, and they are in a measure an unfavorable feature of the market, but the continued demand for the better grades is such as to inspire sellers with a good deal of confidence, and, although the chances for an advance are hardly thought of just now, it is just as unlikely that prices will be lower. With this feeling becoming more general, renewed activity is looked for at an early date, particularly for good Foundry Irons, which, as usual at this season, are very scarce. The steady increase in the output of Pig Iron is a remarkable feature, considering the almost universal complaints of business depression. The chief pressure on the market is from Southern furnaces, apart from which there is very little surplus for sale, so that in spite of all the grumbling there must be a large consumption going on. At the moment there is a disposition to postpone new engagements until after mid-summer, as by that time a better idea of the market can be had, both as regards its extent and the probable course of prices. Besides there is more or less uncertainty in regard to labor, and until there is some definite understanding on the subject large transactions will not be entered into. Meanwhile sales have been made at about \$18.50 @ \$19 for the better class of No. 1 Foundry (in some cases \$18 @ \$18.25), \$17 @ \$17.50 for No. 2 Foundry and \$16 @ \$16.25 for Gray Forge, all tidewater deliveries or its equivalent. Special brands command the usual premium of from \$1 to \$1.50 per ton, and are well taken up. Southern Irons vary considerably, some brands being offered at \$15, \$16 and \$17, ex-ship, while others find a ready market at \$15.50 and \$18. No. 2 not wanted.

Foreign Iron.—There is no demand worth naming, and prices are purely nominal at about \$19 asked for ordinary Bessemer, and \$19.50 for special brands. Spiegel is offered at \$25 for 20%, with no recent transactions.

Blooms.—Iron Blooms are neglected, but there is an increasing demand for Steel, all at about the following quotations: Slabs for Nail Plate, \$29 @ \$31 at tide for Foreign and \$30 at mill for Domestic, and from that to \$35 for higher qualities; special grades for Boiler Plates and other uses requiring high tensile strength, \$34 @ \$36. Other Blooms as follows: Charcoal, \$52 @ \$54; Run-out Anthracite, \$43 @ \$44; Scrap Blooms, \$33 @ \$34, and Ore Blooms, \$34 @ \$35.

Muck Bars.—Demand slow, but without much change in prices. The best makes command \$28.50 @ \$29 at mill, according to location; others can be had at \$28, but there is not much call for them at present.

Bar Iron.—Business in this department continues slow, except in specialties, on which most of the mills are more or less engaged. The demand from large consumers has been very disappointing, and without Skelp and other articles some of the mills would have been compelled to shut down. As it is, they are all able to run tolerably full, although at unsatisfactory prices, which as yet show no signs of improvement. Best Refined Bars nominally 1.85¢, but 1.8¢ is a general quotation, and less than that in some cases. Good medium qualities of Bars 1.75¢ @ 1.75¢, and Skelp 1.82½¢ @ 1.87½¢, with large sales at 1.82½¢ @ 1.85¢.

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Philadelphia.—The market, although very quiet, shows a better tone and is generally thought to indicate improvement at an early date. Outside brands and inferior grades are plentiful and can be had at low figures,

Steel Rails.—The market is steady, but some of the mills are not naming quite as high figures as they did a week ago. Whether it is that they have no room for orders, or for some other cause, \$35 is quoted, as against \$36 last week. There is no scarcity of business, that is certain, but in view of the low price of Foreign Rails it may be thought not good policy to name anything more than what they are willing to take from good buyers. Sales during the week at \$35 for early delivery, and \$34.50 for later dates.

Old Rails.—There is a little more inquiry for Rails, but for some reason it has not been found possible to move spot lots or lots to arrive. One sale was made of 800 tons delivered at an interior point at \$20.25, and another at \$20.50, but both lots were special quality, and therefore brought exceptional prices. For Philadelphia deliveries \$19 @ \$19.50 is asked, but on firm offers these figures could be shaded probably 50¢ per ton.

Scrap Iron.—A little better feeling is reported and more business offering, but without change in prices, which are about as follows: No. 1 Wrought Scrap, \$18.50 @ \$20; No. 2 do., \$13 @ \$14; Turnings, \$14 @ \$14.50; Old Car Wheels, \$15 @ \$16; Old Steel Rails, \$18.50 @ \$20; Fish Plates, \$23.50 @ \$24.50; Cast Scrap, \$14 @ \$15 do. Turnings, \$10 @ \$10.50.

Wrought-Iron Pipe.—There is no change in this department, the demand being entirely satisfactory at steady prices. Discounts: Lap-Welded Black, 57½%; Butt-Welded Black, 42½%; Butt-Welded Galvanized, 32½%; Lap-Welded Galvanized, 40%; Old Rail Tubing, 52½%.

Nails.—The irregularity noted in our last still continues, making it a difficult matter to quote prices correctly. There are said to be a good many inferior Nails on the market, and there are some parties who are bound to sell, so that in such cases firm quotations cannot be expected. There are others whose Nails are always of standard quality, and makers of such will not be drawn into competition with an inferior article; hence their firmness in giving quotations. For such \$2 @ \$2.10 is a firm quotation, while others offer carload lots and upward at considerably less money—how much it would be impossible to state without making a definite offer by way of test. The best brands are steady, however, and command the figures above quoted.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, Pa., June 15, 1886.

The conference committee of the Western Iron manufacturers and the Amalgamated Association have had several meetings within the past few days, and while the wage-scale has not as yet been fully settled there is not much doubt that it will be and a strike avoided. The differences under discussion are unimportant, and the indications at the present writing are that the whole matter will be brought to a satisfactory conclusion in the next day or two. The manufacturers are willing to renew the scale of the present year, and this, with the exception of some minor details, is all that the ironworkers demand. Messrs. Weiske and Martin have been re-elected president and secretary of the Amalgamated Association. Both of these gentlemen have occupied for some years the positions to which they have just been re-elected, and with great satisfaction to all concerned. Now that it is generally believed that the wage-scale will be settled without a strike, a much better feeling obtains in all branches of business, as the Iron interest is the principal interest of Pittsburgh. Wish the exception of Nails, all branches of the Iron and Steel trade are in operation, and, while some are not running full, others are working up to their full capacity. The annual shut-down of the Window-Glass manufacturers will take place next month, and some of them have commenced preparations therefor. The factories will remain idle during the months of July and August, starting up the first of September. The outlook is considered fair for a good fall trade, although it will not be what it would have been had there been no labor troubles, as they have prevented a great many improvements that would have been made this year.

Pig Iron.—The general position of the market remains much the same as for some weeks past, but the probability of the wage-scale being settled without a strike causes a better feeling; however, it is not likely that there will be any improvement in the demand before next month, as consumers generally take stock in July, and they make it a point to close the month of June with as little of the raw material on hand as possible. Brokers and furnace men continue to report trade dull. Nearly all the home furnaces are busy, but are working on contracts made some time ago. There has been very little new business offering for some time past. The consumption in this immediate vicinity keeps up well, as nearly all the puddling furnaces are in operation, some of them working double turn, and it is estimated that about 5000 tons of Pig Iron are being melted here daily.

Structural Iron.—A little better demand is reported for small lots, but nothing that will give the mills more than two or three weeks' work. Large orders appear to be very scarce at present, although manufacturers are hopeful that after midsummer a good deal of work will come out. Prices are rather easier, and on good-sized lots Plates and Angles can be shaded. The usual quotations are as follows: 2¢ @ 2.05¢, delivered, for Angles; 2.1¢ @ 2.2¢ for Bridge Plate; 2.4¢ @ 2.5¢ for Tees, and 3¢ for Beams and Channels.

Sheet Iron.—There is a good deal of irregularity in this department, some busy, others dull, although on the whole there is probably a full average demand. Prices vary with quality; some makers quote from 15¢ to 20¢ less than others, but those who are determined to maintain their reputation for quality find it impossible to compete with those who make a cheaper grade. The following quotations, therefore, are for the very best makes; other descriptions can be had above intimated:

Best Refined, Nos. 26, 27 and 28..... \$24.50
Best Refined, Nos. 18 to 25..... \$24.50
Common, 14¢ less than the above..... \$24.50
Best Bloom Sheets, Nos. 26 to 28..... \$24.50
Best Bloom Sheets, Nos. 28 to 35..... \$24.50
Best Bloom Sheets, Nos. 18 to 21..... \$24.50
Best Bloom..... \$24.50
Best Bloom, Annealed..... \$24.50
Best Bloom, Galvanized, discount..... \$24.50
Common, discount..... \$24.50

although the outlook for realizing any advance is not very encouraging. Prices continue weak, and for the time buyers have the advantage. We quote as follows:

Neutral Gray Forge..... \$16.00 @ \$16.25, 4 mos.
All-Ore Mill..... 16.50 @ \$17.50, 4 " "
White and Mottled..... 14.50 @ \$15.50, 4 " "
No. 1 Foundry..... 16.00 @ \$18.50, 4 " "
No. 2 Foundry..... 17.00 @ \$17.50, 4 " "
Charcoal Foundry..... 20.00 @ \$24.00, 4 " "
Cold-Blast Charcoal..... 22.00 @ \$27.00, 4 " "
Bessemer Iron..... 18.50 @ \$19.00, 4 " "

A large block of Bessemer Iron is said to have been sold the past week—5000 tons—but the price as yet has not been reliably reported; one report is \$18, another \$18.15 and still another \$18.25, cash.

Muck Bar.—There have been no sales reported the past week, in the absence of which we continue to quote at \$27 @ \$27.50, cash, as to quality. There is usually more inquiry during the summer months, and anything of a desirable quality cannot be had below our quotations. Some mills refuse to sell at the highest price quoted.

Manufactured Iron.—There has been an increased demand for some weeks past, owing in large part to anticipations of a strike, but now orders will probably fall off, and, besides, the demand usually subsides at this season of the year. The indications are that business the last half of the year will be better than it was the first half unless something unforeseen turns up, as stocks in hands of both jobbers and consumers are comparatively light, and an increased consumption is looked for. Prices may be quoted for best quality Iron on a basis of 1.65¢ @ 1.70¢ rates for Merchant Bars; Old Rail Tubing from one to three tenths less.

Nails.—Are quoted at \$2.15, 60 days, 2% off for cash, with a rebate of 10¢ per kg on carlots and upward. It is said that sales are being made from store in a jobbing way at \$2.05, cash. There was nothing of an important character developed at the meeting of the Western Association at Chicago last week. The outlook is considered favorable for a fair fall trade, as the supply both in first and second brands is comparatively light and an increased demand is expected.

Wrought-Iron Pipe.—There is nothing new to note in this market; the mills continue very busy, and it is difficult to place an order of any magnitude for near-by delivery. The activity in Pipe creates an active demand for Pipe Iron, and some of the mills have been working almost exclusively on Pipe Iron all this year. Natural-gas companies are putting immense quantities of Pipe into the ground, and the indications are that the Pipe trade will continue active for a year or more to come, unless the supply of gas gives out, which is not improbable. Gas has been known to exist in this locality for many years, but it is only within a few years that it has been utilized. Prices remain unchanged. Discounts on Black Butt-Welded Pipe 45%; on Galvanized do., 35%; on Black Lap-Welded, 60%; Galvanized do., 42%; The above are for carlots, and for anything less discounts are 2½% less than those quoted. Boiler Tubes, 52½% off regular list; Casing, 55%; 2-inch Oil-Well Tubing, 14¢ per foot, net; 8-inch Drive Pipe, \$1.30 per foot, net.

consequently less anxious to sell, and are holding tolerably firm to figures quoted. Actual sales have not increased materially, but inquiries are much more frequent. Those who buy are doing so with more liberality in quantity, and in all their dealings display increased confidence in present values and future trade. Lake Superior Charcoal Iron in carload lots is held with greater firmness at \$20 @ \$20.50 than it was 10 days ago. Coke Irons have perhaps settled down to a more regular figure, \$19 being the price named for average grades. Only a few sales of Cinder Mixed are reported at \$18, carload lots. Ohio Standard Blackbands have not been selling quite so freely during the past week, though there have been numerous inquiries for lots at a less figure than prices named. The Briar Hill Co. continue to hold their Iron at \$20.50 in lots ranging from carloads to 1000 tons. As they have sold their Iron well ahead they are in a position to be firmer than makers of some of the other brands, which could be had at \$19.50 @ \$20, according to quantity. Prices offered on Southern Iron in this market are undoubtedly no inducement to furnacemen. Sales of round lots could be made by shading figures asked from \$1 to \$1.50 a ton, but makers continue to quote No. 1 Foundry at \$17.50 @ \$18; No. 2, \$17; Nos. 2 1/2 and 3, \$15.50 @ \$16.50. Several of the weak features prominently in the market a week ago have disappeared. Round lots that were presumably in the hands of outside parties have either been disposed of or withdrawn. The financial necessities of several furnace companies seem to be less pressing and therefore the points which were regarded as most likely to bring disaster upon the market have temporarily subsided. If sufficient new work comes up during the next 20 days to take up the surplus Iron there is every reason to believe that no lower prices will be reached. The conditions governing the market have fluctuated so greatly in the last 30 days that no one seemed capable of adopting a policy to which they could steadily adhere. This wavering is now less conspicuous, and furnacemen are apparently adopting a course which must result in better prices if they can carry their good intentions into practice. From inquiries and circumstances it is believed that there will be a steady buying in small lots during the summer months, and that with the opening up of fall trade business will again reach the standard it had attained during the early part of the year.

Merchant Steel.—With the exception of the new business that is likely to grow out of special contracts for work, there is nothing in the Steel market which changes its position from a week ago. Sales are made at the present time only in small lots, and merchants are not willing to anticipate immediate demand. From manufacturers prices are perhaps a trifle stronger, but no changes in figures are made. Sales from store are based on previous quotations.

Steel Rails.—The only important point in connection with the market is the growing inclination of railroad companies to buy Foreign Rails. Rumors are numerous about the quantities that have been bought East and West, but nothing of a definite character is at hand. Makers here report a number of inquiries for small lots, principally for immediate delivery, which they are unable to accept. On new contracts for fall delivery they quote \$38 for first quality and \$34.50 for seconds.

Bar Iron.—There has been a fairly good trade for the best quality of Bar Iron during the week. Country merchants, anticipating a probable change in price July 1 or perhaps an entire shut-down of the mills, are laying in small stocks. Railroads are placing specifications for such material as they may require in the next 30 days, and in some instances have placed orders for shipment in July. The small jobbing trade has not improved any on the better quality of New Puddled Iron, which is quoted at 1.85¢ rates from store. Common Iron from Old Rail stock is still dull and quoted at 1.75¢ rates from store. Manufacturers of this class of Iron are very cautious in accepting orders, and when quotations are made they usually specify for delivery before July 1. From mill in carload lots, desirable specifications, Common Iron is quoted at 1.55¢ @ 1.60¢, according to quantity of extras and quality of Iron. Best Refined New Puddled Iron is quoted from mill at 1.75¢ rates, immediate shipment, when the order contains a liberal amount of extras.

Structural Iron.—Trade is confined entirely to small lots for building purposes. Specifications for several large out-of-town buildings and additional bridgework were sent out during the week for estimates. No large buildings are contemplated in this city. No changes are noted in prices.

Plate and Tank Iron.—There has been considerable demand for this class of Iron recently, and close figures have been made by competitors for the work, which resulted in the placing of a number of fair-sized orders for Steel Boiler Plates with Eastern mills. Prices out of store are unchanged, and from mill somewhat irregular.

Old Rails.—There was an improvement in the inquiry for Old Rails during the week, but the prices asked by holders are above the figures that buyers are willing to pay. We quote \$18.50, Chicago delivery, and \$19, Milwaukee. Those who have large stocks

are holding for better prices, and it is only the small dealer who is willing to sell at these figures.

Old Wheels.—There is also some revival in the demand for Old Wheels, and sellers have advanced their figures about \$1.70 ton over that which they asked two weeks ago. Old Wheels that were then offered at \$14.50 they now demand \$15.50, and do not appear anxious to sell at that. Buyers are in the market who would be willing to take 100 to 300 tons at from 75¢ to \$1 below this figure.

Pig Lead.—The market is much firmer, in sympathy with the advance in New York. We quote 4.60¢, Chicago, and 4.55¢, St. Louis. Manufacturers, however, complain of extremely light orders, and in the absence of any improvement in this direction they will not purchase beyond what may be needed for actual requirements.

Birmingham.

BIRMINGHAM, ALA., June 14, 1886.

With crops well enough advanced and promising, thanks to continued good weather, and with the mineral and manufacturing interests fairly prosperous, business continues satisfactory throughout this whole region of country, and better than is usual at this time of the year in this place. Jobbers do not complain of any great falling off of trade as yet, and the railroads are doing a good deal better than their average summer business.

Pig Iron.—All along the line again the Iron trade seems to be mending, and nowhere else is the improvement more manifest than in Pig Iron. There is now a degree of activity in the demand for this staple that justifies expectation of better prices. A number of sales are reported as made in the last few days, some of them being of fair volume. The better part of the new orders seem to come from the East, though Iron is going North and West steadily again. Since freights have continued going regularly again stocks have been reduced rapidly. The news items of the week in Pig-Iron circles is the breaking of ground for the foundations of the Pratt Coal and Iron Co.'s first furnace, for which the Linn Iron Works have been building engines and making wrought-iron parts for a year or more. It is to be the largest in the South, measuring 20 x 80 feet. The ground plan calls for three others of the same size, and these will doubtless be built before a great while.

Finished Iron.—Here again the demand seems solidly better without actually moving prices quotably, but only promising to do so. What with the recent stoppage on account of the change of gauge and a subsequent accumulation of orders, the capacity of the Birmingham mills is just now considerably short of their needs.

Chains.—The Chain works are another local enterprise that has orders ahead of its capacity. In all directions its product is steadily pushing its way into new territory.

Nails.—Are about as they were a week ago, a brisk local trade contributing to check a downward tendency of the market.

Miscellaneous.—There is very little news to be gathered at the foundries and shops, although all are as busy as could reasonably be desired. Among the jobs they have booked in the last few days is the Iron parts for a considerable enlargement of the drying plant of one of the large lumber concerns down the L. and N. Railroad.

Coal.—Some of the smaller Steam Coal concerns are reducing their output, but altogether the volume of production is heavy and the business outlook satisfactory.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., CHATTANOOGA, June 14, 1886.

There has been no change worth noting in the general course of business. Farmers are busy with their crops and have no time to attend to anything else at present. The wheat crop is large and is now being harvested, and is expected to be more than an average yield. The railroads are getting into shape to take all freight offered. The great convenience of the change of gauge has more than realized the expectations of the managers. There is no complaint among the manufacturers of a want of orders, and they are running full, and some of them have in view an early increase of their capacity.

Pig Iron.—Is moving along in its own quiet way, and there is very little to offer that is either encouraging or discouraging.

The furnaces are marketing their products about as fast as made, and, while they are piling up some stock, it is a fact that some of them are still behind with their orders, and if called upon for a round lot of Foundry Iron for immediate delivery would have to decline the order. There is certainly no uneasiness being felt by any of them in regard to the disposal of their product, and they express the belief that an advance in price will take place before long. The consumption of Pig Iron with Southern foundries is an item of no small consideration with many of the furnaces now, and, what is more, it is daily on the increase. Many of the founders are finding a market for their goods through the North and East. Efforts have been made by interested parties to induce the railroads leading from the Pig-Iron producing centers to raise the price

of freights to the East, but without effect; in fact, it is the declared policy of the lines carrying Iron to the Eastern markets to keep the freights as they are, and the result is that large blocks of Pig are finding a ready market in the Eastern cities. Prices can hardly be quoted for large lots, but small sales are made on a basis of \$12.50 for No. 3, \$13.50 @ \$13.75 for No. 2, and \$14.25 @ \$14.50 for superior and well-known grades of Foundry Irons.

Coal and Coke.—One of the greatest annoyances of the Southern furnace owners has been the short supply of Coke, and there is scarcely a furnace now in operation that has not been compelled at times to run from hand-to-mouth on the supply of Coke, and many others have been obliged to bank until a few carloads could be got in. Great efforts have been made by the owners of the Coal mines to add ovens from time to time, but there is still an insufficient supply, and much loss to some of the furnaces has been the result. With Coal lying in every direction and in the greatest quantities this condition of affairs may seem somewhat strange, yet it is nevertheless a fact. The short supply will not continue much longer, however, for efforts are now making to add to the capacity of some of the largest mines by the erection of more than 1000 additional ovens, which, when completed, will change the condition of the Coke supply materially.

Cincinnati.

JUNE 14, 1886.

Pig Iron.—The market in the past week shows some new features. Without any reports from dealers of concessions in prices of Southern Irons consumers state that offers are being made them at from 50¢ to \$1 less than last week's quotations, and without any considerable increase of sales. The disposition on the part of most producers is to realize on their output and to accept orders for current delivery through the coming several months. Quotations of sales in the past week, f.o.b., here, or less, on the freight to Cincinnati when orders are filled for direct shipment from furnaces:

Charcoal Foundry.

Missouri \$17.00 @ \$18.50

Southern 17.50 @ 18.50

Coal and Coke Foundry.

Southern, No. 1 18.00 @ 18.50

Southern, No. 2 17.00 @ 17.50

Ohio Softeners 17.00 @ 18.00

Mill Iron.

Missouri 16.50 @ 16.50

Southern 15.00 @ 15.00

Car-Wheel and Malleable Irons.

Southern 20.00 @ 25.00

Lake Superior 21.00 @ 22.00

Scrap, &c.

Old Wheels 15.00 @ 16.50

Connellsville Coke (Frick's) 5.00

Charcoal.

Hanging Rock, Best, No. 1, 4 mos. \$21.00 @ 21.50

Hanging Rock, Good, No. 1, 4 mos. 20.00 @ 20.50

Hanging Rock, Good, No. 2, 4 mos. 18.50 @ 19.00

Southern No. 1, 4 mos. 18.00 @ 18.50

Southern No. 2, 4 mos. 17.50 @ 18.00

Coal Foundry.

Southern No. 1, 4 mos. 16.50 @ 17.50

Southern No. 2, 4 mos. 15.50 @ 16.50

Ohio and West Pennsylvania, No. 1, 4 mos. 18.00 @ 20.00

Ohio and West Pennsylvania, No. 2, 4 mos. 17.00 @ 18.00

Southern—Virginia, Tennessee, Alabama and Georgia, No. 1, 4 mos. 17.00 @ 18.00

Southern—Virginia, Tennessee, Alabama and Georgia, No. 2, 4 mos. 16.00 @ 17.00

Close Foundry and Mill grades 14.50 @ 15.50

Silver-Gray Softeners.

Ohio Stonecoal, No. 1, 4 mos. 17.50 @ 18.50

Ohio Stonecoal, No. 2, 4 mos. 16.50 @ 17.50

Ohio Stonecoal, No. 3, 4 mos. 15.00 @ 17.00

Car-Wheel.

Southern Warm-Blast Char. cash 17.50 @ 18.00

Southern Standard Warm-Blast Charcoal, 4 mos. 23.00 @ 25.00

Hanging Rock, Warm-Blast Charcoal, 4 mos. 19.00 @ 20.00

Hanging Rock, Cold-Blast Charcoal, 4 mos. 23.50 @ 26.00

Southern Cold-Blast Charcoal, 4 mos. 24.50 @ 26.00

Maryland and Virginia 27.00 @ 29.00

Forge.

Southern Coke, Neutral, 4 mos. 15.00 @ 15.50

Southern Coke, Cold-Blast, 4 mos. 14.00 @ 14.50

Southern Coke, low grades 15.50 @ 14.00

Other makes, various grades 15.00 @ 17.00

Scrap.

Rails 30.00 @ 30.50

Wheels 16.50 @ 17.00

Wrought, for range of grades, \$100.0050 @ .60

Cast, for range of grades, \$100.0050 @ .60

Customary discount 40 @ 50¢ per ton cash from time prices.

Louisville.

W. B. BELKNAP & CO., Louisville, write as follows, under date of June 14: The market finally begins to show some signs of animation, not so much from the consumers' demand as a desire on the part of jobbers and dealers to sort up frequently depleted stocks, and there is no doubt that stocks have been permitted to run down to the lowest possible point consistent with doing any business at all. As July approaches, when it is known that the demand must improve, there is more or less anxiety to prepare for it on the present extremely low basis of prices. There is no cutting of Bar Iron that we can learn of, and where contracts have been taken at inside figures the deliveries are not very prompt. The agricultural districts still continue to promise fair harvests, and while the prices to be realized may be as anticipated, very low, nevertheless the cost of raising crops has been much reduced, as well as the cost of getting them to market. Our June Opera Festival, which has been in progress here this week, has proven an unequal success in attracting our neighbors of smaller towns, and with them, of course, some buyers put in their appearance, much to the gratification of jobbers generally.

Bar Iron.—As we note above, is firm, but is still quiet. Some of the larger manufacturing concerns are endeavoring to place their orders for annual supply, which creates a better feeling.

Hoops and Bands.—Are still very low and there is no special inquiry for them.

Sheet.—As the active season for Sheet Iron approaches the demand increases and inquiries for 50 and 100 bundle lots are not uncommon.

Steel.—The syndicate of Steel Plate Shape makers has been in session for two or three days, all of the principal firms being represented. While there was no attempt made to unduly boost prices, the deliberations were successful in establishing a better understanding and feeling among the members which should result in benefit to both manufacturers and the trade at large.

Nails.—From some quarters are reported weaker, but from others, notably the West and Northwest, the market is stronger, incident to the desire to sort up stock for fall trade. The decline in Steel Nails has been

more marked than that of Iron. The manufacturers of the latter in the West have surprised the trade by the amount of backbone they have shown, and either goes to show that further concession is impossible or that there is a better demand for Iron Nails than is commonly supposed. Wire Nails still continue to move in fair lots, but there is nothing extraordinary about them. It would seem as though a reduction in price might be in order to stimulate the demand.

Wire.—The spring season being well over Wire is extremely quiet, and we fancy the manufacturers are beginning to feel it. Prices are down, and the makers are feeling around for good-sized orders. It would seem that it was certainly safe, judging by the past, to lay it in now. All talk of pools, syndicates and better prices, except when warranted by larger demand, has subsided.

St. Louis.

ROGERS, BROWN & CO., St. Louis, W. H. SHIELDS, manager, report, under date of June 14: The market is very irregular and the buyers are holding off, waiting to see what the market will do. There is very little stock in consumers' hands, and, taking everything into consideration, the prospects are bright. We quote for cash on cars, St. Louis:

Charcoal Foundry.

Missouri \$17.00 @ \$18.50

Southern 17.50 @

Trade Report.

General Hardware.

The market presents few new features. Prices remain without any material change. The demand is moderate, orders being for the most part limited to goods required to complete assortments. A few Southern buyers are in town. Reports from the West indicate an improved feeling and somewhat better condition of things.

BARE WIRE.

The market is quiet, with occasional sales of round lots. We quote 4.30 cents to 4.35 cents for carload lots of Four-point Galvanized Barb Wire, and 4.5 cents for small lots.

NAILS.

While in the New York market sales have been made in large lots at the low figures prevailing for the last few weeks, it is noted that the market is waning. One by one agents of different mills decline to meet the low figures, and those who are still willing to do business on that basis do not show much eagerness. So far as we can learn, there has been no buying on speculation, the mills declining generally to name prices until specifications are at hand. We quote for Iron Nails from store \$2 to \$2.10, with the usual concession for carload lots from dock.

MISCELLANEOUS PRICES.

The following are the list prices of the Patent Diamond Pointed Steel Screws which are being put on the market by the Russell & Erwin Mfg. Co., New Britain, Conn., and New York, a description of them being given among our Hardware Novelties on page 31. The list is subject to a discount of 50 per cent.:

Size.	No. 4.	No. 6.	No. 8.	No. 10.	No. 12.	No. 14.	No. 16.
1/2	0.15	0.15					
3/4	0.15	0.16	0.18	0.21	0.24	0.29	
1	0.17	0.19	0.21	0.24	0.29		
1 1/4	0.22	0.25	0.29	0.34			
1 1/2	0.25	0.28	0.33	0.40	0.47	0.55	
1 3/4	0.29	0.33	0.37	0.42	0.52	0.63	
2	0.37	0.42	0.47	0.52	0.58	0.71	
2 1/2	0.53	0.59	0.68	0.85			
3		0.83	0.98	1.04			
3 1/2		1.10	1.14	1.22			

(Measurement from Under Head to Point.)

The following is the revised price list of Malleable Iron Gas, Water and Steam Fittings recently adopted by the Manufacturers' Association:

Class.	A.	B.	C.
Per lb., cents.	25	35	41

The standard list of Galvanized Malleable Iron Fittings adopted by the association is as follows:

Class.	A.	B.	C.
Per lb., cents.	35	50	18

The Lock manufacturers held their semi-annual meeting on Tuesday, 15th inst., at the Windsor Hotel, in this city. The list prices of the cheap grade of Locks was changed as follows:

Per doz.	4 1/2-in Upright Rim Knob Locks, Cap off	Reverse, Coppered Cast-Iron Key	\$2.40
4 1/2-in Horizontal Rim Knob Locks, Cap off			2.65
Reverse, Coppered Cast-Iron Key			2.40
3 1/2-in Mortise Knob Locks, Cap off, Re-verse, Coppered Cast-Iron Key			2.40

The present discounts and terms were confirmed.

In accordance with this action the Russell & Erwin Mfg. Co. have issued a circular announcing that they have changed the list prices on the following numbers of Door Locks, the discounts remaining unchanged:

20206	18904	9000
32.65	32.40	24.40

The market on Tinware is irregular. The Central Stamping Co.'s revised list went into operation on the 1st inst., but they are very generally making net prices, close buyers purchasing almost uniformly on this basis.

The Association of Southern Plow Manufacturers met in Louisville last week for the purpose of considering the feasibility of establishing more uniform prices. The meeting adjourned with undetermined action, and will probably meet again early in July, when the matter will be presented in more definite form. This association is composed of 12 firms making Steel Plows in the South, and of this number nine were represented, including the following:

THE SOUTHERN AGRICULTURAL WORKS, Atlanta, Ga.

A. F. FARQUHAR & Co., York, Pa.

NASHVILLE PLOW CO., Nashville, Tenn.

ALEX. SPEER & SONS, Pittsburgh, Pa.

PENNSYLVANIA DROP FORGE CO., Pitts-

burgh, Pa.

GAUTIER STEEL CO., Johnstown, Pa.

TOWERS & SULLIVAN MFG. CO., Rome,

Ga.

B. F. AVERY & SONS, Louisville, Ky.

THOMAS MEIKLE & Co., Louisville, Ky.

There have been some reductions in the prices of some leading patterns of Post Hole Diggers. Kohler's Little Giant is now quoted at \$18 per dozen, Kohler's Hercules at \$16 per dozen, and Kohler's New Champion at \$9 per dozen.

APPLE PARERS.

Inquiries to the leading manufacturers of Apple Parers do not elicit announcements of anything specially new or important in regard to this line of goods. Some new machines are being put on the market the present season, but as a rule the goods will be about the same as those with which the trade are already familiar. The Goodell Co., Antrim, N. H., refer as follows to their line:

We have nothing new in the Apple Parer

line except our Eureka 1886 Apple Parer, Corer and Slicer. This machine is similar to the one we put out last season, but it is about one-third heavier, and stronger in every way, and there are, besides, several very important improvements. Our last year's machine was acknowledged to be the best in the market, but this is far in advance of it. We have taken plenty of time on it to have everything right, and put samples out early in the spring and had them thoroughly tested, and we are quite sure it is all we claim it to be. It is designed especially for the evaporating trade. The price, \$18, is very low, considering the capacity of the machine, and there is every indication that we shall sell a large number this season. Of the family machines, our White Mountain Apple Parer, Corer and Slicer, and the new Lightning Parer, will take the lead. The latter machine is a decided improvement over the old Lightning Parer, having been strengthened and improved by the addition of an automatic push-off. The motion, too, is different from the old machine, making it much easier to operate. We claim it to be the best Parer in the world. As to outlook for trade, would say the sale of these goods depends almost wholly upon the apple crop. The indications are at present that, unless something unforeseen occurs to injure the crop, there will be an abundance of apples, and we hope a corresponding sale of Parers.

C. E. Hudson, Leominster, Mass., refers as follows to the machines which he is putting on the market this year:

I have nothing new for Apple Parers this season, excepting improvements on my regular machines. The Rocking Table Parer has been greatly strengthened in its heretofore weak spots. The push-off is now fastened on with a wire staple, and it is utterly impossible to loosen or break it by any fair means. A larger handle is also being used on the machine, and the Parer is now believed to be perfect. The Little Star Parer, Corer and Slicer is provided with an improved slicing and coring knife, which is especially adapted for soft and imperfect fruit. The thumb-latch is thrown out of engagement with the shaft automatically when the fruit has been operated on, so that but one hand is required to work the machine. The finish and workmanship of these two machines are of the very best. I consider the outlook for trade in my line of business as good. My early orders are coming in very satisfactorily.

L. A. Sayre, Newark, N. J., in his circular devoted to this line of goods, in addition to the Wavory Apple Parer and the Jersey Apple Parer, Corer and Slicer, which were upon the market last year, represents also the Ideal Apple Parer, Corer and Slicer, which is a new machine intended for family use. The rod is described as having a deep thread, so that there is no danger of the guide slipping out, and it is explained that the guide is thrown out of position by the handle when the apple is finished, and that the rod is free to be drawn back when the push-off expels the core automatically. The Monarch Peach and Apple Parer is also described, and an illustration given of it. It has a solid, one-piece frame, with double clamp holding the machine firmly to the table, and, the table-clamp being a part of the machine, it is pointed out that it cannot be lost or mislaid, and there is no danger of the machine falling from it. The rotating knife has a slit or opening in the edge, which is referred to as a special advantage in paring fuzzy or withered fruit, as it presents the cutting edge—an initial point—at each revolution of the knife.

THE NASON MFG. CO.,

1 Beeckman street, New York, issued June 10 the following sheet of discounts from price lists contained in their catalogue April, 1886, the revised classification and price list of Malleable Iron, Gas, Water and Steam Fittings, and of Galvanized Malleable Iron Fittings, being substituted for the lists given on pages 18 to 22 in the catalogue:

Dis. per cent.

5 Lap Welded American Charcoal Iron Boiler Tubes

5 Wrought-Iron Pipe, in whole lengths—

Plain 1/4 inch and under

Plain 1/2 inch and over

Galvanized 1/4 inch and under

Galvanized 1/2 inch and over

When cut to order, advance 8 per cent. on dis-

cant, and cutting extra.

7 Iron Hydraulic Pipe

7 Heavy Drive Well Pump

8 Light Galvanized Leader Pipe

8 Galvanized Adjustable Elbows

8 Gas Pipe

8 Fittings for Spiral Riveted Pipe

9 Cast-Iron Drain, Water and Smoke Pipe

10 Cast-Iron Water and Gas Pipe

Market rates

11 Lead Pipe 64 cents per pound

12 Cast-Iron Fittings

13 Bushings and Plugs

14 Flanges, Branch Trees, Hook Plates

15 Malleable Iron Bushings

16 Malleable Iron Fittings

17 Gas-Pipe Hooks, Wrought Iron

18 Ceiling and Floor Plates

19 Blake's Adjustable Pipe Hangers

20 Malleable Iron Fittings—Revised classi-

cation and prices

Class A. Price, 25¢ per lb.

Class B. Price, 35¢ per lb.

Class C. Price, 45¢ per lb.

Price, per lb. 35¢ 30¢ 18¢

21 Foot Valves and Strainers

22 Iron Foot Valves and Strainer

23 Mushroom Strainers

24 Expansion Joints, Iron Body

25 Iron Body Valves, Brass Mounted

26 Brass Valves, Cock, &c.

27 Valves, Standard Pattern

28 Heavy Pattern

29 Steam Cocks, Standard

30 Steam Cocks, Heavy Pattern

31 Expansion Joints, Heavy Pattern

32 Air Cylinder and Gauge Cocks

33 Gas Cocks and Soldering Fittings

34 Quick Opening Elevator Valves

35 Water Gauges

36 Nason's Improved Water Columns

37 Steam Gauge Cocks

38, Radiator Valves and Cocks	55	Oak Tanned Leather Belting	55
Radiator Angle Valves	65	112-113. Nason's Free-End Tube Steam Boiler	55
Radiator Air Cocks	65	114. Nason's Free-End Tube Hot Water Boiler	55
Jenkins' Radiator Angle Valves	60	115. Nason's Low Pressure Regulator, with Reservoir	20
Radiator Angle Valves with Spindle	60</		

stant repairs, and also allows of a great saving in cultivation of land, permitting the cultivation of nearly every foot of land a man owns. It is, moreover, undoubtedly nearer; hence we say there must be soon a great diminution of the quantity of Nails sold. It is already felt by us and others similarly situated. Parties who have always bought one or two kegs of 10d. or 12d. Nails now buy by the pound. The aggregate is very large, as one can easily see. Will not this tend to decrease production? It must do so more and more. Barb Wire will soon take the place of all other Fencing in this country, and if we were Nail manufacturers we should not increase our plant.

From a Western Hardware house we have the following suggestion as to how to keep bright goods from rust. Our correspondents advise us that for this purpose they use blue ointment, and say:

Take a woolen rag, put a little of the blue ointment on it, and rub on goods just enough to put a thin film over it. It does not decrease the polish, as some other applications do, and we have samples treated thus 4½ years ago, and they are to-day as bright as then. A half-pound will go much further than a person would suppose.

ARRANGEMENT OF HARDWARE STORES.

The Custer Beam Works, Philadelphia, suggest the following method of accommodating and exhibiting Scale Beams in a retail store, which we doubt not will be appreciated by many of our readers. These goods are rather inconvenient to exhibit, and the method described below will command itself to some in the trade. It will be seen

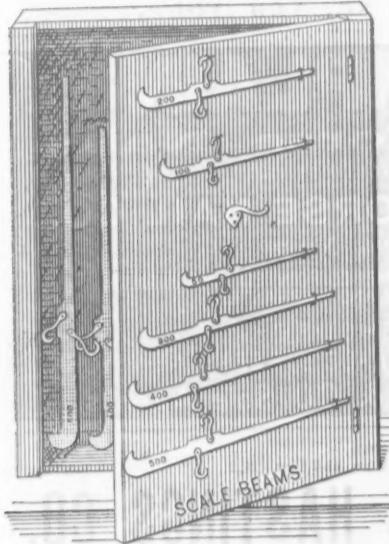


Fig. 101.—Case for Scale Beams.

that the stock is kept in a case, Fig. 101, the door of which has the samples on the outside. This case is placed in the shelf above the counter shelf. The different sizes in the case are separated by pins or other partitions. The hook on the door of the case is, as our readers will understand, for the purpose of exhibiting and trying a Scale Beam in selling it. A space 4 feet high and 2 feet wide is referred to as accommodating three of each of the leading sizes, which is all that is necessary for loose stock, the balance being kept in original cases elsewhere.

WIRE NAILS.

We continue below extracts from letters from all parts of the country in regard to Wire Nails. It will be observed that there is very general agreement as to their utility for many uses, and some difference of opinion as to their adaptability to take the place of Cut Nails. Occasional reference is also made to the relative merits of Steel and Iron Cut Nails. We also give the views of some of the manufacturers of Wire Nails who have written us on the subject.

From a Nebraska traveler, who has been giving the matter of Wire Nails a thorough canvass in Nebraska during the past year we have the following statement, which we take pleasure in laying before our readers:

At first orders were small, owing to an unreasonable prejudice, as the general appearance was so different from the Cut Nails, and doubts as to their holding and resisting qualities were discussed. Sample orders dispelled these ideas, and to-day almost every town I have in the State is selling good quantities of them. I have customers in small towns who buy 25 to 100 keg lots, and a number who sell more than they did of the Cut Nail. At first carpenters had an unfounded prejudice toward them, but not being able to substantiate it by honest objections are gradually working them into general use, and many good contractors will use nothing else from the ½-inch Brad to the 6d. Spike. The 2, 2½ and 3 inch Molding Wire Nails are also becoming popular for finishing. At the present rate of increase the Cut Nail will be a thing of the past, just as the patent Brad has been thoroughly superseded by the Wire. Let any man who uses Nails for any purpose give the Wire Nail a trial, and if he is unprejudiced I predict he will advocate their use.

The following extracts are from letters recently received from some of the manufacturers of Wire Nails, and may be of interest as giving a ground for comparison between their views and those of merchants:

We have been making Wire Nails since 1877, and while we have not pushed the business, but simply supplied our customers who called for them, yet the demand has constantly increased, and we are now running some 20 machines. It is evident the use of the Wire Nails will rapidly increase for pattern-making, house-furnishing and

other fine work. The Wire Nails are displacing the Cut Finishing Nails, our trade in the latter having fallen off, just about in the same proportion as our Wire Nail trade has grown, simply showing that in one case they have taken the place of Cut Finishing and Cut Patent Brads.

We are giving some attention to the manufacture of Wire Nails. We think the high prices of small Cut Nails and also Tacks held by the combination (Central Mfg. Co.) has increased the demand for Wire Nails, but, as that combination is broken and the smaller Cut Nails can be bought so very low, we think it must affect the demand for Wire Nails.

We are manufacturing Wire Nails in a small way in connection with our other manufactures. There seems to be a gradual increase in the trade, and we are contemplating an increase in our machinery, so as to make all classes of work. The improvements made in the machinery, and the comparative cheapness of Wire, are tending to supplant the ordinary Cut Nails, especially when they are not required to clinch with these goods. It is confidently believed by many that the ordinary Cut Nail will eventually go entirely out of use.

Our recent experience has amounted to a very satisfactory realization of brightest hopes, and the largely-increased demand, which at first was attributed to unnatural causes, has now proved itself a wholesome and legitimate demand, the natural consequence of the universally acknowledged fact that the Wire Nail in many respects and for many purposes is vastly superior to the Cut Nail. The Standard Wire Nail is no longer an unknown quantity in any section, though the demand proceeds more largely from some sections than others. The progress of this Nail has been more rapid than was at first expected even by the most sanguine. We have been and are making special endeavors to extend the sphere of the Standard Nail, and consider it one of the most important and beneficial steps taken by Wire Nail manufacturers.

We have no cause to complain of the results of our efforts to compete with Cut Nails. The outlook for Wire Nails generally is fair to those who control every stage of the process, from the ore up. Not particularly so to those factories which are compelled to pay profit to the wire and rod mill and the converter.

While the general outlook for Wire Nails is not particularly bright, yet we are fairly busy, owing, we suppose, to the fact that our goods are manufactured especially with a view to a standard of excellence. We notice with satisfaction that our patent Barbed Nails are daily growing in favor, and we find no difficulty in placing them at the combination rates. The Standard Penny Wire Nails are gradually being recognized and appreciated on their merits, and we have no doubt that the immediate future will show a considerably increased demand for this class of goods.

Replying to your inquiry, we would say that the introduction of the Standard Wire Nail in competition with the Cut Nail is meeting with a success entirely beyond our expectation, and we are having no trouble in selling all we can make of this class of goods. There is no particular class of trade who have adopted the Wire Nail, but all, and especially the Hardware trade, find that the Wire Nail meets with a ready sale wherever offered. But we find that after the Wire Nail has once been used it is almost next to impossible for the Cut Nail men to obtain the trade again, and we can conceive of no purpose for which the ordinary Cut Nail is used that the Wire Nail is not preferable.

Regarding Standard Wire Nails would say so far as we are concerned they are making but little progress in competition with Cut Nails, in consequence of the low price of the latter.

We can hardly tell you anything new about Wire Nails. They are growing steadily into favor, and, as far as we know, give great satisfaction. We never have regarded it the mission of Wire Nails to displace Cut Nails in the market, but we have felt certain that there is a distinct place and demand for the Wire Nail for very many purposes where it is better than a Cut Nail. We are going into their manufacture extensively, and are making preparations to produce them on a very large scale. We are becoming impressed with the fact, however, that a great many people have gone into the manufacture of these goods, and, like many of the older industries, it is already considerably overdone. The supply exceeds the present demand, and the competition is necessarily severe. A great many manufacturers have gone into it in a small way, and have remained in it long enough to discover that the margins are too close to permit of any limited production of Wire Nails.

The following letters are from Hardware merchants, large and small:

Atlanta, Ga.—There is little demand for Flat Heads or the Penny Nails, but the Wire Brads have superseded the Patent Brads and small Finishing Nails that we shall buy no more of them. Our contractors say the Wire Brads are just the thing for hardwood and any wood that is easy to split.

Brockport, N. Y.—This spring I put in a complete line of Wire Nails, HP, from ½ to 3 inches. The sales are very satisfactory, and displace to a certain extent, say one-third, the Finishing Nails. In smaller sizes the sales are far more brisk. In sizes over 1½ inches sales are more slow. In no sense are they displacing Cut Nails. At present I do not regard a displacement of Cut Nails possible even to a small extent. Mechanics like the small sizes in most kinds of work, but would like them better were they barbed. I have found some difficulty in getting orders filled by jobbers. This goes to make me think that my experience may not be the general one.

Canandaigua, N. Y.—There is an increasing sale of Wire Nails, especially the Molding Nails, but as a rule the quantities sold each customer are small. Standard Wire Nails are selling in competition with Cut Nails only for box or crate work. Many customers buy them, but only in small quantities.

Mechanics as a rule do not buy them largely, except for finishing work or hardwood, or for special kinds of work. In our judgment the Wire Nail has come to stay, but it will be a long time before it takes the place of the Cut Nail. The trade have got to be educated up to the real value of the Nail, and to paying the difference in price.

Anderson, Ind.—I find that there is a steadily increasing demand for the Wire Nail and the people are fast learning its superiority over the Cut Nail. As yet we are not keeping a full line of them, but are adding as the trade demands. They are used quite extensively in our sash and door factories with entire satisfaction, and it is my opinion that the time is not far distant when the demand for all sizes will be general.

Greensboro, N. C.—Wire Nails have not as yet been introduced in this market; hence there is no demand. We think they could be very successfully used to take the place of the ordinary Cut Nail in many instances. The most prominent we have in our mind is in the manufacture of fruit and handle crates, tobacco boxes and hogheads.

Ottawa, Kan.—Wire Nails have been sold in this place but a few months, as the trade have no fondness for increasing the number of lines of Nails to be carried in stock. We think, however, that Wire Nails will be used largely everywhere as soon as their merits are fully known, and it looks now as if the trade would be compelled to carry full lines of Iron, Steel and Wire Nails, the difficulty about which is the space required for Nail bins, and the fact that every tenth customer will want an explanation of the comparative merits of each kind for his particular work.

Urbana, Ill.—The demand with us for Wire Nails is not large. So far they have been used mostly in making boxes, for which purpose they seem very desirable. They hold much better than Cut Nail, and the advantage of the Wire over the Cut Nail is especially plain when driven into the end of a board or in a line with the grain.

Clarkburg, W. Va.—As Wire Nails have not been introduced in this section to any extent, we are unable to give you any opinion in regard to them. We have never handled any of them except 1-inch, but think the Wire Nail would be too tough for general use. We find one objection to Steel Nails to be that you can hardly remove a board put on with them without destroying the board.

Waverly, N. Y.—Our trade has increased right along in the use of Wire Nails and Brads, and this spring the Wire Brads have run the Finishing Nails and Patent Brads out. Have not sold a paper of Finishing Nails in two months. The Wire Nails go slower, but for hardwood our carpenters take them every time, as they can drive them without splitting.

Princeton, Ill.—We commenced selling Wire Nails two years ago, furnishing them to the city for sidewalks. The city found them just what they wanted, as they held equal to Cut Spikes, and did not split in entering plank, leaving a crack or rough hole for moisture to enter. Then they use hardwood for sleepers, and the Wire Nails cause no trouble in driving. We are selling a great many more now than we ever did before, and anticipate a largely increasing demand for them. We are selling Wire Nails for houses, residences and sidewalks and bridge building, but do not think they will be used by our average customer, the farmer, for his general use on farm for fences, corn cribs and temporary outhouses. In this country or section the average Hardware dealer's Nail trade is with the farmers, but we do think they will come into general use in residence building. Our mechanics recommend them to builders. We predict a bright future for Wire Nails.

New Albany, Ind.—We find that our sales on Wire Nails are gradually increasing. We sell Wire and Molding Nails from ½ to 2½ inches, and have recently had calls for 3-inch. They are used only in place of Finishing and Casing Nails. We know of none of our customers who would use them in place of Cut Nails as yet, but as soon as we see favorable indications we will try it.

Waltham, Mass.—The sale of Wire Nails increases every day, and where I kept only a few papers a year ago I now buy in full packages, the Cut Finishing Nails having been superseded almost entirely. The sizes used are from ½ to 2 inch, and are used for all purposes for which the Finishing Nail was used. They have not as yet interfered with the Cut Nails. I have never kept or sold any. Mechanics prefer the Wire Brads to any other, as they do not split the wood in driving, and make a neater job.

Batesville, Ark.—The small sizes of Wire Nails, ½, 1 and 1½, meet with great favor, and are especially adapted for the lumber of this section (yellow pine), as they do not split the wood. The larger sizes do not take well and I have not been able to induce workers to give them a fair trial or give their reason for not wanting to use them. About all the satisfaction I could get was the reply: "The old kind of Nails suits me well enough."

Mansfield, Ohio.—Our trade in Wire Nails is steadily growing. We sell them almost entirely for finishing, and recently have sold a great many of the common Wire Nails. Six-penny are very commonly used for ½-inch siding. Our shippers prefer them for packing boxes. They say that a smaller size answers the purpose of a large Cut Nail, and that the number in a pound more than makes the difference in price. I have only heard one objection raised by mechanics—that where mistakes in work occur it is impossible to get it apart. There does not seem to be much demand for the large sizes.

Johnstown, N. Y.—I find an increasing sale for Wire Nails. Have sold and carry stock in 1-pound papers. Wire Nails: Flat Head, ½ inch—13; 1 inch—14 and 15; 1½ inch—13, 14 and 15; 1½ inch—12, 13, 14 and 15; 1½ inch—12, 13 and 15; 2 inch—12 and 13; 2½ inch—12 and 13; 2½ inch—12. Molding or Finishing, ½ inch—17; 1 inch—15 and 16; 1½ inch—15 and 16; 1½

inch—13, 14, 15 and 16; 1½ inch—12, 13 and 14; 2 inch—12 and 13; 2½ inch—12 and 13, and 2½ inch—12. The Molding Nails are taking the place of Cut Finishing Nails and Brads. After once using the Molding Nail for hardwood finishing a mechanic will use no other. They are stiffer, draw better and show less than an ordinary Finishing Nail. One great advantage is that they do not split the wood.

It is said that an experienced molder with proper assistance can make 2000 bricks in a day when working by hand. The molded bricks are permitted to partially dry in the sun, and are then stacked in kilns for burning. The fuel varies, but when available anthracite screenings are usually employed. With coal the burning requires from four to six days, and the cooling of the kiln about the same time. Building brick for city fronts and the better class of work are made in the same manner, except that better clay is used, and the operations are more carefully performed. Pressed brick, such as are made at Baltimore with success, are molded larger than required, and then compressed to the proper size in a brick press. The color and smoothness depend upon the molding sand employed. All of the operations are conducted under cover, and the bricks are laid on their faces in drying instead of on end, as with the common kinds. Special precautions are also required in firing. The arches and four or five lower courses are made of common brick, and the pressed brick on top of these. The burning requires from 10 to 12 days. The bricks are allowed to cool slowly, and when taken from the kiln are sorted, the defective ones being rejected. The ornamental and intaglio bricks now so popular are made in similar manner, save that even greater care is required.

Glazed brick are now largely used for both interior and exterior decoration. They are manufactured in Ohio and elsewhere in the United States. For this purpose an ordinary red or light-colored brick is used, and a suitable enamel produced on the surfaces to be exposed. Some colors are very easily obtained. A simple lead glaze on a cheap buff fire-brick makes a good yellow. A manganese and iron glaze is used for black. White and blue are the most difficult to produce, since the red color of the ordinary brick must first be hidden by an opaque layer of white before the finishing glaze is applied. Green must be made in the same way. Roofing tiles are made by ordinary brick clay. This is first molded into strips about 6 inches wide and ½ inch thick, and is then cut into desired lengths. Oil is used to keep the clay smooth and prevent the plates from sticking. A specially devised machine then trims off the edge of the plate to a symmetrical shape, and presses it to the desired pattern. It takes about two weeks in a steam-heated chamber to dry the tiles, as the oil hinders the escape of moisture. They are piled loosely in a kiln to a depth of 6 feet, and subjected to a slight firing. Several designs of tile are made. The shingle tile is simply a slab of burnt clay 12 x 6 x ½ inches, having suitable holes for the nails to pass through which hold them to the roof. The diamond tiles hook into each other, and are more ornamental, but less durable. The chief objection to roofs of this character is in their excessive weight. A 10-foot square of plain shingle tile weighs about 1100 pounds; of the diamond tile, from 650 to 850 pounds.

The manufacture of door knobs as carried on at East Liverpool, Ohio, is of considerable interest, since it requires a careful mixing of the different clays to obtain a well-marbled product. Each color of clay is worked separately and is first put through a process called boiling. A vertical cylinder about 6 feet in diameter, and carrying in the center a revolving rod provided with stirring and cutting arms arranged spirally, is filled with the requisite amounts of water and clay. It is then set in motion by horse power, and the clay beaten to a thin mud or slip. This is run through a fine bolting cloth into a large tank, from which it is dipped into an evaporating pan heated by suitable furnaces. When removed from the pan the clay is soft and plastic, and is piled up and covered with wet blankets to keep it tempered. The clay, when ready for use, is "wedged." A block of both colors is cut by a wire into six or eight layers each, which are piled alternately into a new block of double the size. This is thrown down with violence to consolidate the layers. It is then cut and wedged, and so on until the colors are marbled into fine alternating streaks. Thus prepared the clay is molded into proper shape by stamping in a die. The knobs are dried, and when somewhat hard are turned to a smooth, regular face. They are then thoroughly dried and burned twice—once as biscuit, and then dipped in glaze and burned again.

A terra-cotta lumber has recently been added to the list of mineral building materials. A kaolinite of good quality is mixed with sawdust, worked by machinery into slabs, and is then burned, sawed and dressed. It is in this condition ready for market, and is said to be indestructible by fire, water or gases. It is a poor conductor, and suffers but slight expansion or contraction with changes of temperature. Its weight is put down at one-half that of brick. It can be worked with edge tools, bored and sawed, and holds nails as readily as timber. It is also made into hollow tile and fire-proof casing. Mr. Wilbur's report to the Government, from which our information is taken, also gives the statistics of production of the United States, together with the imports and exports.

The Ironworkers' Scale.

We receive the following telegram from our Pittsburgh correspondent as we go to press: "The scale conference committee reconvened to day at 2 p. m. at the rooms of the Western Iron Association. It is expected that the scale will be finished to-day and signed. The main points have already been amicably arranged, and the only difficulty to be bridged over is the fixing of the price for a few specialties. There is no danger of a strike as matters now stand. Both sides have been more than usually liberal."

June 17, 1886.

THE IRON AGE.

27

MECHANICAL.

Giddings' Valve Dynamometer.

In our issue of June 3 we referred briefly to the results of some experiments on the power required to move slide-valves, communicated

also that the valve-stem A comes to a bearing against the pin in the sleeve D. When in operation the valve-stem guide first pulls the sleeve D by means of the pin, thence the strain is transferred through the springs to the sleeve C, which pulls the valve-stem by means of its pin, as shown. But

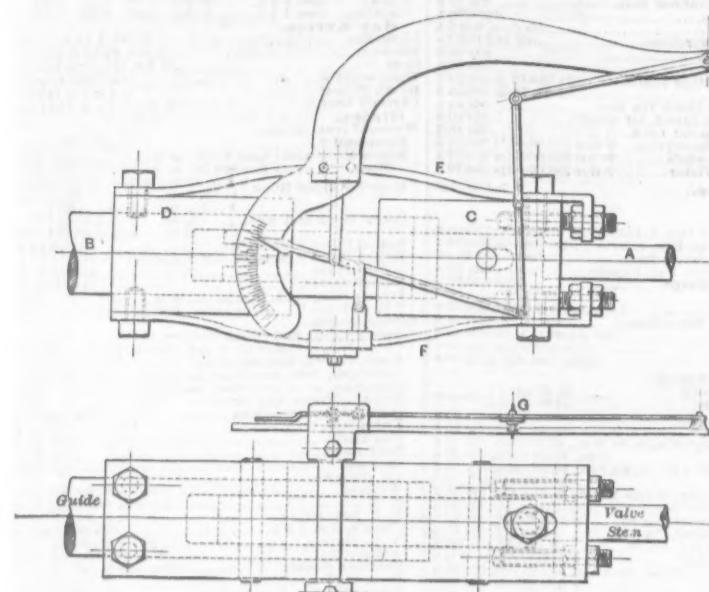


Fig. 1.—Elevation and Plan of Apparatus.

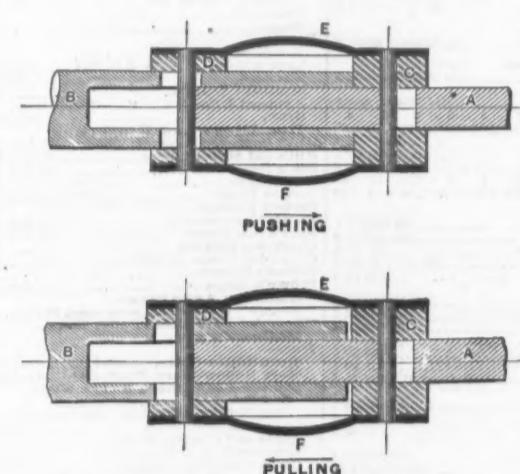


Fig. 2.—Section Illustrating Principles Involved in Device.

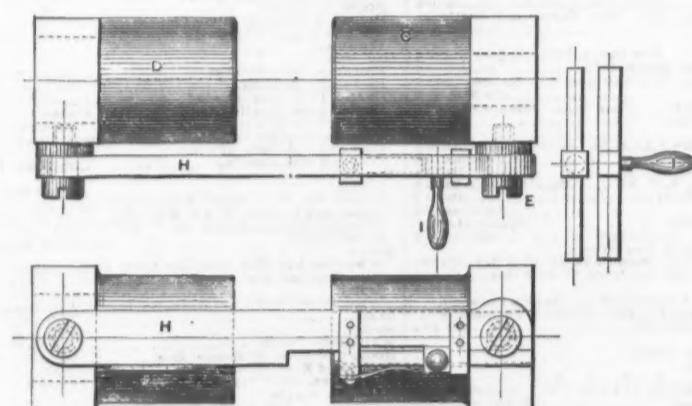


Fig. 3.—Details of Device.

GIDDINGS' VALVE DYNAMOMETER.

to the American Society of Mechanical Engineers at their recent meeting by Mr. C. M. Giddings, of Massillon, Ohio. From the description of the apparatus used in these experiments and furnished at the time of this meeting we take the following particulars and engravings:

The instrument as designed by Mr. Giddings is shown in Fig. 1. A section illustrating the mechanical principles involved in the device is given in Fig. 2. In this cut E and F are elliptical springs attached at their extremities to the sliding sleeves C and D. The former is the valve-stem guide to which the eccentric-rod is attached, and the latter is the stem itself. To each spring suitable attachments are made for connecting the pivoted extremities of the parallel motion which carries the pencil G. A slide having suitable support was provided which worked between grooves having an adjustable stop, so that the paper mounted on the slide could be brought in proper contact with the pencil and the stop properly adjusted. Then in order to take a card it is simply necessary to bring the paper in contact with the moving pencil during one complete revolution of the engine. A flat pointed brass wire was attached to the instrument, so that when the paper was brought in contact with the pencil this point would mark the neutral line, or line of no strain on the card, from which all measurements were taken.

It was a comparatively easy matter to design an instrument which would show the pull required by the valve, but when it came to showing the push required in the same instrument it was quite another thing. Of course it was impracticable to push on the ends of the springs; consequently, the strain must be taken by the springs on the pull through both strokes of the valve. How this was done can best be shown by referring to Fig. 2 in which corresponding letters refer to corresponding parts in Fig. 1. D is a sleeve sliding loose upon the valve-stem guide B and attached to the springs, C is the sleeve sliding loose upon the valve-stem A. Each of the sleeves has a steel pin fixed in the sleeve, and passing through slots in the center of the valve-stem and valve stem guide respectively. It will be noticed that the valve-stem guide B comes to a bearing against the sleeve C,

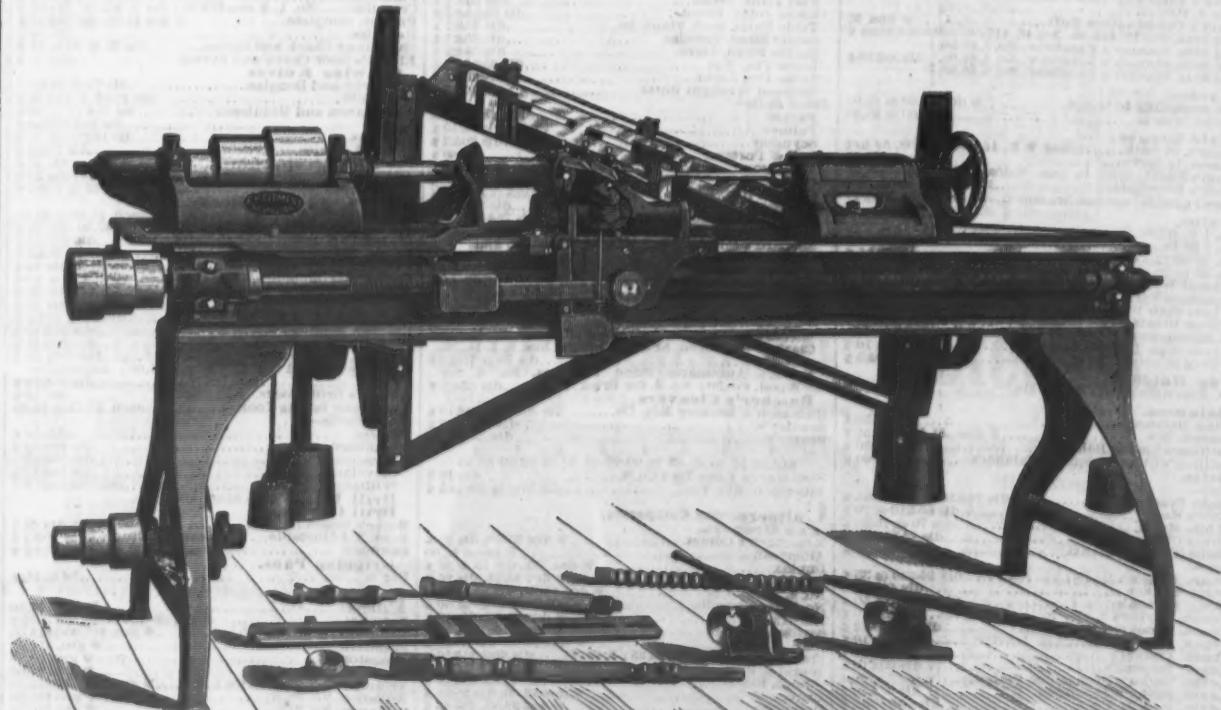
when it comes to the push part of the stroke the valve-stem guide B first pushes against the sleeve C without moving the valve-stem; thence the strain goes back through the springs to the sleeve D, which pushes on the end of the valve-stem by means of its pin and thus moves the valve.

The strain always goes through the springs on the pull, and is then measured and recorded by the instrument. The rigid connection shown in Fig. 3 consists simply of the bar H hinged to the sleeve D and hooking over a post, E, on the sleeve C, and having a sliding-catch, I, to hold it either on or off the post E. When this connection was locked in position it was intended that there should be no movement of the pencil, but owing to the spring of the parts the pencil did move, so that it could not be used to draw the neutral line. It was found that springs of this kind could be made stiff enough to move the valve without permitting any appreciable reduction of the stroke, and at the same time would be elastic enough to feel the slight variations of the strain and produce sufficient movement when multiplied by means of the levers to make a good card. But this same quality prevents adjusting the springs equally for valves of different size, and it was decided to use springs of different thickness to meet this case. A scale by which to measure the cards taken by the various springs was easily constructed by the use of a spring scale known to be accurate, and noting the movement of pencil for each 50 pounds strain added to the dynamometer. In computing these cards the height gives the maximum, minimum and average strain on the valve-stem in pounds. This multiplied by the rate of movement gives the foot-pounds of work done to move the valve. Fig. 4 shows cards taken with varying loads, and Fig. 5 shows cards taken from varying points of cut-off. All cards taken with any considerable load invariably show one end (and that always the same end) heavier than the other. The cause of this for a time was a mystery, but was fully and satisfactorily explained by taking into consideration the area of the valve-stem, which, multiplied by the pressure in the steam-chest, worked against the instrument in one half of the stroke and with it in the other half, making the difference in strain equal to the sum of the pressures.

bility and fine proportion, and it is claimed to be the outcome of long experience on this class of work. The arbors, centers, feed-screw, &c., are of steel, and the bearings are extra long and carefully scraped and tested before shipping. The main turning

shaft is of the Siemens drum type, the core being built up of alternate layers of tinned wrought iron and paper. The tinned iron is stamped into the proper diameter, and at the center is stamped out a blank, so as to leave a "key" attached to the disk. A key-way being milled the whole length of the armature shaft, the disks are thus held in place, and are pressed tightly together by screw-heads at each end. In the armatures wound on the Hefner-Altenbeck plan the windings at the end of the armature cross each other without the formation of the usual hump, the ends being perfectly flat, so that the armature presents a symmetrical appearance, and is completely balanced. Instead of using a single wire in the armature winding, four smaller wires of a total equal cross-section to the larger size are employed, but this is a form used in the Edison-Hopkinson and other types. Two sizes of these machines are being made—one with an output of 200 amperes and 100 volts, and the other 75 amperes and 100 volts, the larger machine weighing 2400 pounds complete, and the smaller 560 pounds, the relative speeds being 1200 and 1600 revolutions per minute. It is stated that the machines run very smoothly, and the brushes, which have very

General Newton, chief of engineers, urgently recommends the proposed appropriation of \$1,000,000 for the improvement of New York Harbor. The plan approved by him is that recommended by the Board of Army Engineers, which is the construction of a stone dike running about south-south-east from Coney Island to such a distance as



IMPROVED AUTOMATIC LATHE, BUILT BY F. H. CLEMENT, ROCHESTER, N. Y.

chisels are adjustable by patented devices, so as to be set absolutely accurate as to diameter of cut without stopping the lathe, and the shaping chisel is raised automatically from the form on the return of the carriage. The pattern-knife gate is fitted in rigid slides, and is counterbalanced at both ends

little lead, exhibit no sparking. The efficiency obtained is a high one.

Another dynamo recently introduced is the Westinghouse. This is of the Siemens type, shunt wound with an armature of unusual elongation, and its internal construction is such that Foucault currents are

shall be found necessary, and probably not less than 4 miles; the protection of the head of Sandy Hook, and the dredging of a 30-foot channel from deep water below the Narrows. General Newton has entire confidence in the success of this device.

Current Hardware Prices, June 16, 1886.

HARDWARE.

Ammunition.

Caps, Percussion, \$1000—

Hicks & Goldmark's

Common, 1000, 50¢

E. B. Trimmed Edge, 1-10's, 65¢

E. B. Ground Edge, Central Fire, 1-10's, 70¢

Double Waterproof, 1-10's, 35¢

Musket Waterproof, 1-10's, 35¢

50¢

G. G.

S. B.

Union Metallic Cartridge Co.

F. C. Trimmed, 50¢

F. C. Ground, 65¢

Green Fire Ground, 70¢

Double Waterproof, 1-10's, 35¢

S. B. Genuine Imported, 45¢

Eleven D. Waterproof, Central Fire, 1-10's, 50¢

Cartridges—

Rim Fire Cartridges, 60¢

Common Military Cartridges, 60¢

Common Fire Cartridges, Pistol and Rifle, 40¢

Common Fire Cartridges, Military & Sporting, 30¢

Blank Cartridges, except 22 and 32 cal., an additional 10¢ over above discount

Blank Cartridges, 32 cal., 55¢

Primed Shells and Bullets, 25¢

R. B. Caps, Round Ball, 11¢

R. B. Caps, Conical Ball, Swaged, 11¢

Berdan Primers, all sizes, and B. L. Caps for

Sturtevant Shells, all sizes, 10¢

All other Primers, all sizes, 10¢

Shot Shells, 1st & 2d S. G. qual, 25¢

Schofield's Combination Shot Shells, 25¢

Paper Shot Shells, 1st & 2d S. G. qual, 25¢

Paper Shot Shells, Standard, 25¢

Blank Shot Shells, 1st quality, 60¢

Brass Shot Shells, Club, Riva & Climax, 55¢

Wads—

U. M. C. & W. R. A. B. E., 11 up, \$2.00

U. M. C. & W. R. A. B. E., 2.30

U. M. C. & W. R. A. B. E., 11 up, 3.10

U. M. C. & W. R. A. B. E., 4.00

Eleven D. Waterproof, 1-10's, 45¢

Eleven D. Waterproof, Central Fire, 1-10's, 50¢

Cartridges—

Rim Fire Cartridges, 60¢

Common Military Cartridges, 60¢

Common Fire Cartridges, 40¢

Common Fire Cartridges, 30¢

Blank Cartridges, 32 cal., 55¢

Primed Shells and Bullets, 25¢

R. B. Caps, Round Ball, 11¢

R. B. Caps, Conical Ball, Swaged, 11¢

Eleven D. Waterproof, 1-10's, 45¢

Eleven D. Waterproof, Central Fire, 1-10's, 50¢

Cartridges—

Rim Fire Cartridges, 60¢

Common Military Cartridges, 60¢

Common Fire Cartridges, 40¢

Common Fire Cartridges, 30¢

Blank Cartridges, 32 cal., 55¢

Primed Shells and Bullets, 25¢

R. B. Caps, Round Ball, 11¢

R. B. Caps, Conical Ball, Swaged, 11¢

Common, 11 up, \$2.00

Common, 11 up, 2.30

Common, 11 up, 3.10

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Hardware Novelties.

Adjustable Socket Wrench.

We show below a form of adjustable socket wrench which is being introduced to the trade by H. G. Sellman, of South Lyon, Mich. The wrench is arranged with a square shank for use in an ordinary bit brace. The

The sizes which are made and the prices at which they are quoted are given in the Trade Report.

Browne's Squirrel and Gopher Smoker.

The accompanying illustration represents this article, which is made by F. E. Browne, Los Angeles, Cal. As indicated in the cut,

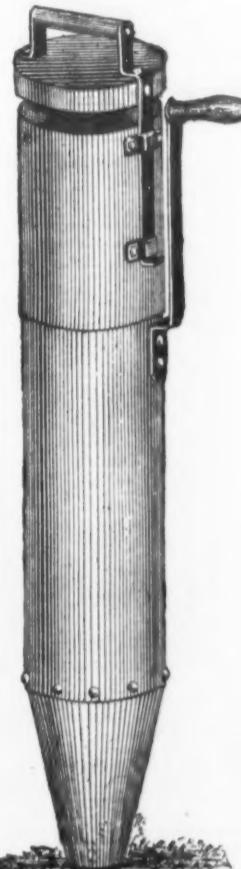


Sellman's Adjustable Socket Wrench.

chuck is of such construction that the four fingers shown in the engraving are forced outward by a spring and are contracted by being pushed inward. Accordingly, on being set over a square-headed nut and pushed against them they clasp the nut firmly. The wrench is adapted to a wide range of sizes of heads, and at the same time in its parts is of the simplest possible construction. Its efficiency is manifest for all kinds of work in which there are a large number of nuts to be run on or off, as, for example, in putting together machines and tools. Among these may be mentioned agricultural implements, also carriages and wagons. It is also referred to as a useful addition to a carpenter's kit. The inside faces of the fingers or grips are beveled inwardly, so as to assure firm holding of the nut and to avoid slipping.

Kolb's Common Sense Screw-Driver.

This article, which is represented in the accompanying engravings, Figs. 1 and 2, is made by G. F. Kolb, the patentee, 732 Sansom street, Philadelphia, Pa. Fig. 1 shows the manner in which the screw-driver holds a screw, so as to facilitate its insertion, and in many cases obviates the necessity of using a gimlet to make a hole for the screw. Fig. 2 illustrates the position of the attachment when it is desired to use the screw-driver in the ordinary way, without clasping the screw, as in Fig. 1. It will thus be seen that this article consists of a sliding attachment to a screw-driver of nearly the usual form, making a tool with a clasping device as represented. The object of this is that the screw may be firmly held in connection with the driver, permitting it to be started and driven in much less than the usual time, and without danger of the screw-driver slipping out of the slot or of the toppling over of the screw. It will be seen that a sliding band passes over the jaws, which when pushed down toward the screw applies a strong pressure which gives a secure grip. The manufacturer points out that this screw-driver is especially valuable for use in corners, overhead or in any place unhandy of access, and alludes also to the advantage that results from having one hand free to hold the work while the other drives the screw. To drive the screw home the jaws are simply pushed back without stopping driving and without taking the driver out of the slot. The utility of the device in taking out a screw is also alluded to. The screw having been loosened with a few turns, the jaws are applied and it comes out easily. The point is also made that in driving a screw it is unnecessary to press against it as with the ordinary driver, because with this screw-driver one cannot lose hold of it, the pressing not helping it, as the screw once started needs only turning and it will draw itself in. This screw driver is made of medium



Browne's Squirrel and Gopher Smoker.

cylinder is drawn up by the handle an opening is made for the admission of air, so that when the pressure is applied to force the outside cylinder down again the valve is closed and the air forced into the smoker, thus causing combustion and driving the smoke, if the operation is continued, out from the lower end of the smoker, which, it will be seen, is made tapering, so as to per-

solder-pot, shown in the cut, resting on the lid. For this purpose the top cover is hinged so as to prevent it from being misplaced or lost. A special feature to which the makers direct attention is the construction of the burners. They claim that, on account of their form and operation, they produce a hotter flame than any other furnace on the market. Inasmuch as they are protected by a jacket from the wind, it is

MANUFACTURING.

Iron and Steel.

The nail plate mill at the Calumet Iron and Steel Co.'s works, at Cummings, Ill., was started up on the 8th inst. The nail factory is running with about 75 machines. The bar mill and steel departments are expected to start in a few days, or as soon as a sufficient number of men is obtained.

The Union Steel Co., of Chicago, commenced blowing steel on the 4th inst., with very satisfactory results.

It is understood that the Old Colony Iron Works, at Somerset, Mass., will be closed and offered for sale.

The Otis Iron and Steel Co., of Cleveland, have just finished the top section of the anvil block for a 15-ton hammer now being built by the Morgan Engineering Co., of Alliance, Ohio, for the Crescent Steel Works, of Pittsburgh. The section weighs 55,170 pounds. This is by more than 50 per cent. heavier than any other steel casting ever made in this country.—*Iron Trade Review*.

The jury in the case of the Iron City National Bank, of Pittsburgh, against the Hinman Furnace Co., of Youngstown, Ohio, returned a verdict for the plaintiff, rendering judgment in the sum of \$18,942.55. The action was brought to recover on a promissory note issued by the president of the company and discounted by the bank.

The new foundry of Jones & Laughlins, between Twenty-eighth and Twenty-ninth streets, Pittsburgh, was totally destroyed by fire Saturday evening, the 12th inst. The loss was \$15,000, fully covered by insurance. The cause of the fire is unknown, but is generally attributed to natural gas.

Geo. Summers' Sons have secured possession of the Niles Ward Mill, at Niles, Ohio, and, under the management of George Summers, Sr., will make a specialty of sheet iron. The Russian Mill, formerly operated by the above firm, is standing idle.

Carnegie Bros. & Co.'s Thirty third street mill, Pittsburgh, started up on double turn in all departments last week.

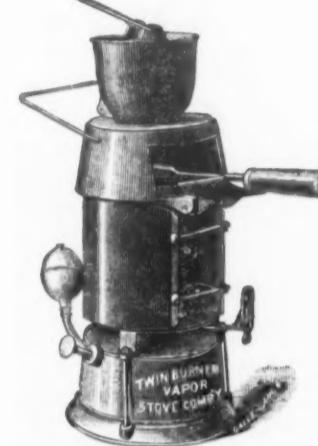
The Edgar Thomson Steel Works, at Braddock, have let the contract for another new furnace, to be known as "G" Furnace. This furnace, as well as the "F" Furnace, will be pushed to early completion. When completed they will make a total of seven furnaces at the Braddock Works.

The nail factory of the Mahoning Valley Iron Co., at Youngstown, Ohio, is completed and ready for operation.

The Junction Iron Co., of Wheeling, W. Va., started up their nail factory at Martin's Ferry, Ohio, double turn, on the 14th inst.

On the evening of the 7th inst. a fire broke out in the lower story of the old factory of the Laughlin Nail Co., at Martin's

claimed that the apparatus is equally well adapted for outdoor and indoor use. The tank for containing the fluid is at the base and is made of brass. Instead of gravity as the means of feeding the fluid to the burners, pressure is obtained by an air blast, the bulb or valve for obtaining the pressure being shown in the engraving. This form of construction renders the apparatus much more desirable than those forms using an



Twin-Burner Fire-Pot for Tinners and Plumbers.

upright tank, with which many of our readers are familiar. The aperture through which the solder coppers are inserted is of convenient shape, and the coppers are supported by a hinged shelf which closes the opening when the melting pot is in use.

New Thick-Set Buckthorn Fencing.

The Buckthorn Fence Co., Trenton, N. J., whose Buckthorn solid steel barbed fencing has been on the market for several years, have recently offered to the trade a new



New Thick-Set Buckthorn Fencing.

barb fence, which they style Thick Set Buckthorn, which is represented in the accompanying illustration. They refer to it as an improvement upon the original in the following respects: That the barbs are contin-

Ferry, Ohio, which for a time threatened the entire structure of the vast property and consequent idleness of several hundred men. After two hours' hard work, however, the flames were subdued, the main portion of the property being saved. The loss amounted to about \$60,000, fully insured. The mill contained 114 nail machines, 96 of them being in operation. It will be rebuilt at once.

The Brier Hill Iron and Coal Co., of Youngstown, Ohio, are making some extensive improvements. At the Tod Furnace they are putting in a set of boilers, three in number, 50 feet long and two 18-inch flues, also one of the largest-sized Keystone pumps, and are building a new draft stack. At the Grace Furnace they are putting in one new Hamilton blowing engine with an 84-inch cylinder and 4-foot stroke.

The Pennsylvania Steel Co., at Steelton, Pa., had 2905 men on their pay-rolls last month.

The Middlesex Rolling Mill, owned by the Wheeler Iron Co., of Sharon, Pa., has been sold to a syndicate of New York and Pittsburgh capitalists, who will convert the works into an extensive plant for the manufacture of steel. The process to be used is the Graphite patent, by which a quality of steel superior to Bessemer can be manufactured direct from the ore. The firm now operating the mill will relinquish its lease about July 1, when the new owners will take possession. This will be the first exclusive steel mill in the Shenango Valley.

Messrs. Gordon, Strobel & Laureau, engineers, of Philadelphia, have closed with the Jefferson Iron Co. for the building of a two 3-ton Bessemer plant at Steubenville, Ohio.

Messrs. Cooper, Hewitt & Co. are putting up a small tilting converter at their Trenton works.

Machinery.

The Paul Mfg. Co., of Minneapolis, Minn., have received an order for 1000 feet of shafting, hangers, &c., from the Minneapolis Exposition.

The Hamilton Machine Co., of St. Louis, Mo., have booked orders for engines and separators to Marquand and Sikeston, Mo., and traction engines and separators to Auburn, Waverly and Girard, Ill., and to Warrenton and Wright City, Mo.

The pumping engine which Smith, Vaile & Co., of Dayton, Ohio, have just completed for the Soldiers' Home, in that city, weighs over 15,000 pounds, and has a capacity of about 1000 gallons per minute.

The Southern Florida Foundry and Machine Co., organized at Orlando, Fla., have a capital stock of \$10,000, and are now erecting buildings, viz: Foundry, 35 x 60; machine

shop and offices, 25 x 74, with engine-room attached; pattern shop, 16 x 47. Capacity of foundry will be about 2½ tons per heat of 1½ hours.

The Great Western Mfg. Co., Leavenworth, Kan., furnish the machinery for the new cement mill plant at Manhattan.

The Smith, Beggs & Ranken Machine Co., of St. Louis, Mo., are building two Corliss engines, 14 x 42 inches and 16 x 42 inches, for mills at Weatherford, Tex. The new 45-ton fly-wheel for the Vulcan Steel Works is being made by them.

The Rohan Bros. Boiler Mfg. Co., of St. Louis, Mo., are building half a dozen huge soap tanks, 32 feet high and 14 feet in diameter, together with two steam boilers, for N. K. Fairbank & Co. The boilers will be 48 inches by 22 feet, with 12 6 inch flues, made of flange steel.

Watson & Stillman, of New York, builders of hydraulic machinery, recently completed the largest hydraulic press they have ever made. It has a 20-inch ram with a 13-foot accumulator, the ram being of 10 tons weight. The steel cylinder weighs 4000 pounds. It is intended for McConley & Farley, of Pittsburgh, Pa.

The Vulcan Iron Works have an order for a set of largest size dredging engines complete from C. S. Barker, Sault Ste. Marie, Mich.

The Haines Car-Starter Co., Chicago, have been incorporated with a capital stock of \$200,000.

The Minneapolis, Minn., Industrial Exposition have purchased four Heine safety boilers aggregating 1000 horse-power, for furnishing steam for the machinery and electric lights.

The N. O. Nelson Mfg. Co., of St. Louis, Mo., report orders for machinery from Southern and Western points steadily improving.

The Eagle Machine Foundry, of Belleville, Ill., was recently incorporated with a capital of \$500 to do general foundry and machine work. The incorporators are William Atchaf, Wm. Schlatt and Gottlieb Klemme.

The Acme Machinery Co., of Cleveland, Ohio, manufacturers of bolt, nut and special machinery, report that for the past two months trade has not been as satisfactory as it was last winter, when they were very busy. The present month, however, has opened up better, and inquiries and orders are increasing.

The Excelsior Foundry and Machine Shop, Birmingham, Ala., of which E. R. Jones is president, have purchased a site and will begin the erection of their buildings at once.

The Ohio Fence Co., Zanesville, Ohio, capital stock \$50,000, have been incorporated to manufacture fence-making machinery.

Miscellaneous.

The Laclede Car Mfg. Co., of St. Louis, have erected an additional building shop, 110 x 50 feet, and a new blacksmith shop, 60 x 40 feet. In the latter they have placed a 700-pound steam hammer, made by Bement, Miles & Co., Philadelphia; also some new forges and other appliances. They are now turning out over a car a day, with orders in hand from Jersey City, N. J.; Chicago, Kansas City, Davenport, Elkhart, Ind.; Emporia, Kan., and Austin, Tex.

A. G. Lamar, of Camden, has leased the Standard Glass Works, at Woodbury, N. J., and will operate them the coming season.

The following table exhibits in gross tons the total lake shipments of iron ore from the mines of the Marquette and Menominee ranges for the current season, up to and including Wednesday, the 9th, together with the shipments from the same ports for the corresponding period of last year.

Name of port.	1886.	1885.
Marquette.....	169,733	98,067
Escanaba.....	311,003	210,632
L'Anse.....		4,567
St. Ignace.....	13,813	17,272
Total.....	495,319	335,988

Gain over the shipments from the same port at the corresponding date last year, 159,411 gross tons. Adding to this the shipments from the Gogebic and Vermillion ranges and we find that there has already gone forward from the Lake Superior districts by lake this year nearly 300,000 tons more or than had been shipped at this stage in the season of 1885.—*Marquette (Mich.) Mining Journal*.

Of the 10,832 ovens in the Connellsburg region there were but 377 idle last week, classified as follows: Pool ovens, 50; furnace ovens, 200; old ovens, 127.

A charter has been issued to the Monongahela City (Pa.) Electric Light Co., with a capital of \$10,000.

The report that the Hemingray Glass Co., of Covington, Ky., propose to establish a glass works in Pittsburgh or vicinity in the near future is without foundation. They have no such intentions at present.

It is stated that Messrs. Holland & Thompson, brass manufacturers, of Troy, N. Y., are to remove their plant to St. Paul, Minn.

Messrs. M. A. Sweeney & Co., of Jeffersonville, Ind., have just completed a powerfully-built sloop boat entire for work on the Chattahoochee River, in Georgia. Length, 125 feet, 25 feet wide; engines, 15 inches by 4-foot stroke; two steel boilers, 40 inches by 25 feet; two powerful capstan engines. This boat was built for Government use and by special specifications. They have just contracted with Major Stickney, of the U. S. A., for a large towboat for use on the Portland Canal.

The De Paud Glass Works, New Albany, Ind., shipped on the 2d inst. the two largest plates of glass ever made in this country. They were 124 x 160 inches and clear as crystal, and were shipped to St. Louis, Mo.

Twenty acres of the Mineral Spring colliery, at Wilkesbarre, sunk in consequence of robbing the piers in the mines beneath, and 400 dwellings were more or less damaged. The workings beneath are said to be a complete wreck.

Fig. 1.—Kolb's Common Sense Screw-Driver, Holding Screw.



Fig. 2.—Kolb's Common Sense Screw Driver—Attachment Not in Use.

size, total length 10 inches, the blade and wings being of steel, with polished brass mountings and ebonized handles.

The Patent Diamond-Pointed Steel Screw.

The Russell & Erwin Mfg. Co., New Britain, Conn., and New York, are putting on the market a new screw named as above, which is represented in the accompanying illustration, which indicates its appearance and general features. These screws are referred to as being readily driven with a



The Diamond Pointed Screw.

hammer their entire length into seasoned oak, maple, hickory or other hardwoods, and if greater holding strength be required it is explained that they may be partially driven by hammering and then turned to be driven with a screw driver. The head is made convex to strengthen it and prevent its splitting when struck with the hammer. The thread is of the ratchet form, for the purpose of permitting its penetration without tearing the wood fibers. It is claimed that these screws hold much better than the ordinary wood screw driven in the usual manner, and that they can be easily removed with a screw-driver, regardless of the manner in which they may have been inserted.

Twin-Burner Fire-Pot.

The Twin Burner Vapor Stove Co., of No. 707 Washington street, St. Louis, Mo., are putting upon the market a plumbings' and tinner's furnace, the general features of which will be understood by the engraving presented herewith. The apparatus is adapted for the use of both plumbings and tinner's. The top cover is arranged to be thrown back, so as to provide a place for the

scamp going under various names and representing himself as a wealthy Southern manufacturer has been giving heavy orders in Philadelphia for machinery, and in the course of his transactions obtained a considerable amount of temporary accommodations.



CIDER PRESSES.

THE BEST IN THE WORLD.

FOR SALE BY THE

NEW YORK PLOW CO.,

57 Beekman St., New York.

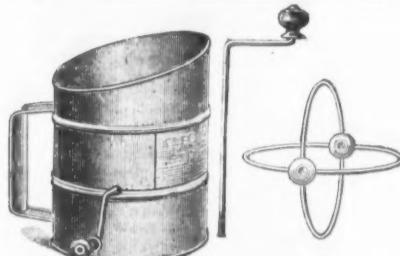
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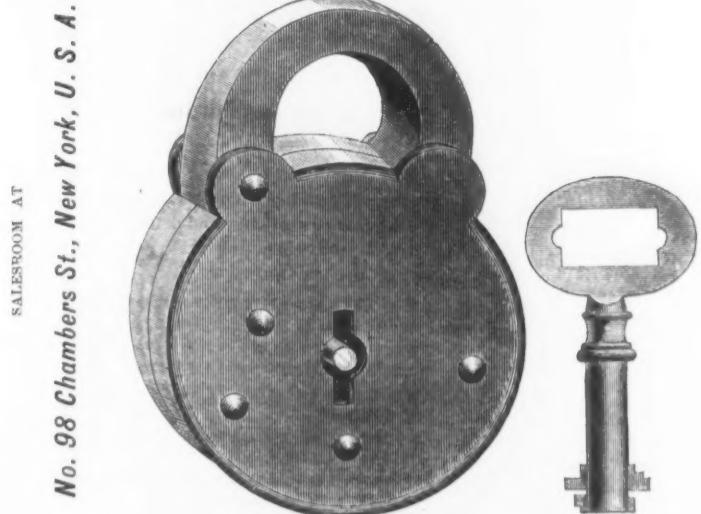
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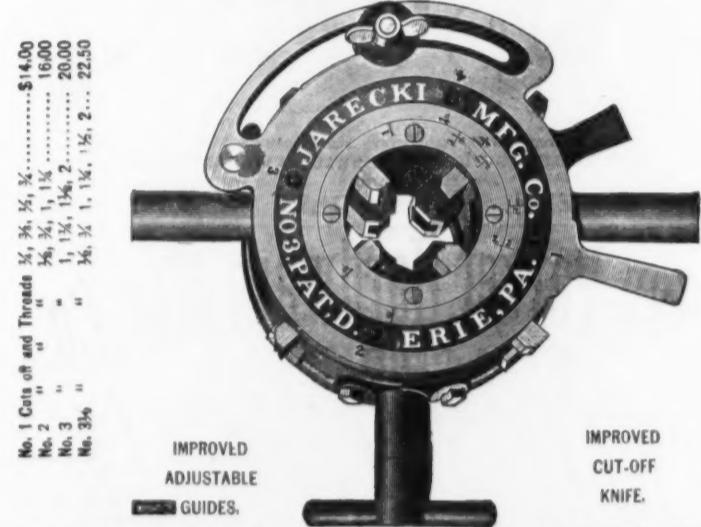
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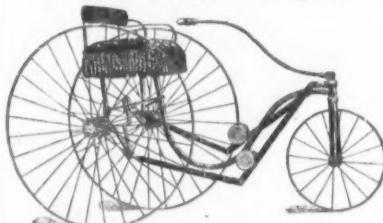
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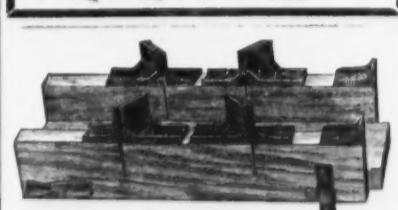
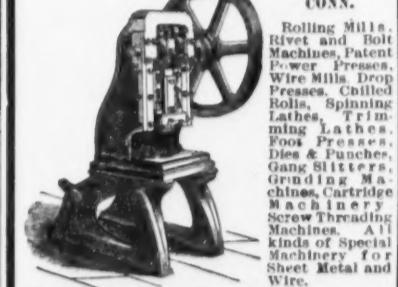
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Has adjustable Iron saw guides for any thickness of saw blade. The saw cannot cut the frame away. They are perfectly true and reliable.

Price, No. 1, will saw molding 1 1/4 in. x 3 in., \$12.00 per dozen. Price, No. 2, will saw molding 2 1/4 in. x 4 in., \$16.00 per dozen.

For Descriptive Circular and Discounts, address

L. H. OLMS TED, Corona, N. J.**"Challenge" Fire Hose Carriage**

Holds from 500 to 800 feet of 2 1/2 inch Hose; 44 inch Wheels; Patent Swing Tool Box; no weight on handles; nickel-plated trimmings; light and easily handled. Price, including 300 feet best quality 2 1/2 inch Linen Hose, \$160.00.

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LARGEST LINE OF

WROUGHT CARRIAGE FORGINGS

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The E. D. CLAPP MFG. CO.,

AUBURN, N. Y.

Ancient Trades Unions.

The notion held by some persons that trades unions and other labor organizations are novelties is erroneous. In Spain, England, France and Germany they have existed from an early day. Readers of Prescott's charming history of the reign of Ferdinand and Isabella should turn again to Vol. I, and refresh their memories about the organizations of tradesmen and workmen in mediæval Castile and Aragon. They will again observe that in Castile the handicrafts were incorporated into guilds under the regulation of magistrates and by-laws of their own appointment, and that, instead of being considered humble occupations, as they came subsequently to be regarded in Spain, they were sustained by liberal patronage, and that their experts had conferred upon them the dignity and rank of knighthood. We do not know whether it is in memory of this particular fact in history that the modern order of Knights of Labor derives its title, but some scholarly knight should look the matter up. In the history of the Kingdom of Aragon, also, it will be recalled to the reader's memory that the tradesmen and mechanics, through their guilds or unions, were recognized as bodies of decided influence, having delegates in the legislative and administrative branches of municipal government. The craftsmen in the different trades, as organized into guilds or companies, were eligible to the highest offices. Thus our own American history, going back to Columbus and with Columbus into the Castilian and Aragonese Kingdoms of Ferdinand and Isabella, takes us right into the guilds and unions of mechanics and tradesmen and assemblies of Knights of Labor. A very interesting and perhaps important chapter of early Spanish history relating to these points remains to be fully written.

The French likewise have their history and experience in trade organizations, which has been written up and published by one of their writers. Paris, as he reminds us, was once governed by its water carriers, Rouen by its drapers, and other cities by their leading crafts, whose monopoly of a particular trade was secured by levying taxes, keeping watch over their members, fighting for the king under the flag of their own union. Thereby their organizations served a good purpose then. These syndicates, as they were then called, for the name is much older than the much-abused system it now represents, concentrated trades as a monopoly. In Paris in the fourteenth century, with its estimated population of 250,000, 20 families had the sole right of selling meat. A lawsuit as to the limits of the tailors and the second-hand clothes men's privileges lasted for 240 years, and ended only in 1776, by a law abolishing incorporated crafts. Against their tyranny various methods of relief were found. Thus, in Paris bakers from the suburbs would come in town and sell bread on Saturdays. Great public fairs, too, broke down their privileges in order to secure outside traders to compete in open market with those of the guilds of the town. The great calamity of the "black death," a plague that ravaged a great part of Europe, brought with it in 1351 the freedom of internal labor and trade, opening to every man who knew a craft the right to exercise it and have as many apprentices as he pleased; but the old system was soon restored. Then the King, to raise money, sold the right to exercise trades in towns that had previously been strictly limited to members of their trade unions, and the unions had to buy up these privileges. The law regulated trades in their minutest details, but some crafts became so unremunerative that no workmen would remain in them, while in others the high fees for becoming members kept the journeymen in a sort of slavery. Then it was declared that the trades unions were the cause of the poverty that preceded the French Revolution, and for a few years they were all abolished, except those of the barbers, druggists, goldsmiths and printers, and finally all trades were thrown open, and associations of men in the same trade were forbidden, as leading to a restraint on individual liberty.

Some curious relics of the past, however, still remain in vigor in France. Thus the fishermen of Marseilles still settle their disputes in a tribunal of their own members which has existed since the fourteenth century. The porters of that city have a union whose records go back to the same distant period. In Havre and other seaports the longshoremen constitute a great co-operative association, formally recognized by the Chambers of Commerce, which there are powerful bodies. Some combinations of French workmen maintained voluntarily for many years an elaborate system of secret societies, which exercised tyrannical power over both employers and employed, but the spirit of insubordination now rife in France and the pressure of hard times have broken them up. On the other hand, builders, carpenters, masons, in all 70 trades, have united in "syndicates" of both masters and men to settle disputes, to avoid strikes, to assist their members in case of sickness, to provide for their families, to educate their children and generally to secure their welfare. There are about a hundred in Paris, and as many outside, but continual disputes are breaking them up, and only two are reported to be really prosperous, the printers and the haters. Thus it will be seen that existing trades unions, the Knights of Labor and other mechanics' organizations are but reproductions of what was known in Europe centuries ago.

The Ohio River is now at a very low mark; consequently, Pittsburgh and Wheeling freights are uncertain, the nail trade especially feeling the loss, causing nearly all traffic to go to the railroads. The low water works beneficially to the Louisville interest in one way. The Government improvements are again begun, and the widening and deepening of the Portland Canal are going on with a vim.

According to a report from Ottawa the secession movement in Nova Scotia is receiving aid from Eastern cities with the object of ultimately securing control of the Canadian fishing grounds.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending June 16, 1886:

Hardware.
Berbecker Julius & Co.
Case, 1
Barbour Bros. & Co.
Mach'y, cs., 25
Bloomfield J. C. & Co.
Mach'y, pkgs., 50
Boker Hermann & Co.
Mose, cs., 6
Carron Bros.
Anvils, 148
Davies, Turner & Co.
Case, 1
Dleckerhoff, Rafloer & Co.
Cases, 8
Drexel, Morgan & Co.
Cases, 16
Farrubar A. B. & Co.
Cases, 2
Field Alfred & Co.
Cases, 10
Anvils, 21
Wire, case, 1
Gerdan Otto.
Pkgs., 505
Golds, 100
Nails, 100
Graef Cutlery Co.
Mdse., cs., 6
Hartley & Graham.
Rifles, cs., 100
Hughes C. A.
Pkgs., 6
Howe, Balch & Fay
Cases, 3
Hammacher, Schlemmer & Co.
Mdse., case, 1
Kastor A.
Mdse., cs., 11
Lamarche H. & Sons,
Mdse., cs., 10
Lawrence Stationery Co.
Casks, 2
Marble S.
Tools, pkgs., 41
Morris Sons, J. P.
Mdse., cs., 11
Morris L. W. & Son.
Mach'y, pkgs., 50
Mosle Bros.
Mach'y, case, 1
Newton & Shipman.
Files, cks., 2
Osborne & Franks.
Cases, 2
Pilkington E.
Case, 1
Pum, Forwood & Co.
Nails, kegs, 12
Rogers J. P. & Co.
Case, 1
Shoverling, Daily & Gales.
Mdse., cs., 4
Cases, 16
Sellers W. B.
Mdse., cs., 3
Strand, Blumenthal & Co.
Cases, 8
Tiebott C. H.
Anvils, 25
Wiebusch & Hilger.
Hardware, cutlery and guns, pkgs., 12
Chains, cks., 25
Mach'y, cs., 9
Mach'y, cks., 12
Cases, 3
Mach'y, pkgs., 7

Iron.
Baring Bros. & Co.
Bars, 2452
Nail rods, bds., 2268
Wire rods, coils, 261
Brockner & Evans.
Spiegel, tons, 188
Brown Bros. & Co.
River rods, coils, 568
Riveted wire rods, coils, 528
Coddington T. B. & Co.
Sheets, bds., 252
Cary & Moen.
Rods, pkgs., 217
Wire, bds., 173
Curtis R. J.
Wire rope, coils, 56
Crown Bros.
Furniture, cks., 300
Spiegel, tons, 350
Davies, Turner & Co.
Iron plates, cs., 19
Latasa & Co.
Ore, tons, 832
Lawrence C.
Spiegel, tons, 750
Lundberg Gust.
Furniture, cks., 627
Buckles, 677
Riveted wire rods, coils, 24
McKinless J. A.
Caskets, 6
Meckerts Oscar.
Wire, cks., 14
Merch. Desp. Co.
Wire, bds., 121
Naylor & Co.
Spiegel, tons, 50
Rods, coils, 811

The imports of Cutlery, Hardware and Metals at this port during the week ending June 11 were as follows:

	Quantity.	Value.
Anvils	125	\$1,140
Antimony	50	351
Brass goods	32	3,771
Bronzes	13	795
Chain and anchors	2	87
Clocks	23	4,119
Copper	114	8,220
Cutterly	27	6,307
Dutch metal	77	11,725
Guns	29	1,272
Hardware	1,375	11,868
Iron, pig, tons	33	2,919
Iron, sheet, tons	2,296	47,425
Iron ore, tons	2,279	4,523
Iron, tubes	70	97
Iron, other, tons	676	11,609
Machinery	51	5,326
Metal goods	583	31,346
Nails	20	565
Old metal	22	6,026
Nickel	10	4,697
Old metal	3	5,384
Platinum	19	12,226
Plated ware	1	1,245
Pins	6	494
Quicksilver	450	13,217
Railroad bars	446	702
Regulat. antimony	184	8,661
Saddlery	10	1,114
Seal	106,598	108,246
Tin, lbs.	35,278	13,246
Tin, 5,407 slabs; 542,607 lb.	124,599	124,599
Wire	945	5,706
Z		

THE IRON AGE BOOK DEPARTMENT.

Architectural Designs Plans and Details.

The Suburban Cottage; Its Design and Construction. By W. B. Tuthill; 117 illustrations, 8vo, cloth. \$1.50

The object of this work is to present to those contemplating building the proper and systematic methods of laying out the work and constructing in all its details a country house. Beginning with the plan, its designs and requirements, the author considers in their order elevations, masonry and brick-work, framing, the roof, general details of exterior and interior finish, plastering and plumbing. The arrangement is logical, and the illustrations which accompany the text add greatly to the value of the book.

Architectural Studies. Part I; 12 Designs for Low-Cost Houses. Portfolio (size 11 by 14 inches), paper cover. \$1

These plates in paper cover contain examples of low-cost houses, together with specifications, bills of materials and estimates of cost. A limited amount of detail work is presented. The designs are for houses ranging in estimated cost from \$1000 to \$4000.

Architectural Studies. Part II; 12 Designs for Store Fronts and Interior Details. Portfolio (size 11 by 14 inches), paper cover. \$1

Containing designs and details for the following classes of stores: Drug store, restaurant, village shop, retail 25-foot store, bank and office finish, cigar store, corner dry-goods store, store front, basement and first story and others.

Architectural Studies. Part III; 12 Designs for Stables. Portfolio (size 11 by 14 inches) paper cover. \$1

Showing designs of stables suitable for village lots, ranging in cost from \$300 upward. In the majority of the designs the perspectives are presented, together with floor plans drawn to scale, and some details.

Architectural Studies. Part IV; 12 Designs for Seaside and Southern Houses. Portfolio (size 11 by 14 inches), paper cover. \$1

These plates show designs for cheaply built houses, with ample veranda room, suitable for summer use. With one or two exceptions, these houses will not exceed in cost \$1500.

Artistic Homes. By A. W. Fuller; revised and enlarged edition, 76 full-page plates, 8 $\frac{1}{2}$ x 12 inches, cloth. \$4.50

In this selection of sketches, which have been prepared in the routine of office work and afterward enlarged to the present form, the author has successfully aimed to give practical hints to those who wish to make their homes not only comfortable, but also artistic, without great expenditure. The plates show a variety of perspectives, elevations, plans and details, with exterior and interior views of Queen Anne and Colonial style villas and cottages costing from \$700 upward.

Drawing and Designing.

Manual of Industrial Drawing for Carpenters and Other Wood-Workers. By W. F. Decker, Instructor in Drawing in the University of Minnesota. 29 plates and many illustrations, 176 pages, 8vo, cloth. \$2

One of the best books on mechanical drawing for the use of apprentices and workmen that has appeared. Thorough instruction is given in the art of making working drawings, and the advantages of such drawings to the workmen are explained. The author's method is simple and direct. The book is arranged in nine chapters, treating of rough sketches; drawing instruments and materials, with many practical suggestions as to their selection and use; lettering and titles; definitions and geometrical problems; elementary projection; applications of projections; isometrical and cabinet projections; house plans and methods of laying out rafters. An appendix contains the specifications for a frame building.

Hulme.—Mathematical Drawing Instruments, and How to Use Them. By F. E. Hulme; 152 pages, 8vo, 61 illus., cloth. \$1.50

This is one of the best works upon drawing instruments now in the market. Although originally intended for the English reader, it is no less valuable to those who live in America. This work is not only a thorough treatise on the various instruments used in drawing, but includes instructions in regard to drawing and tracing papers, how to trace and how to copy drawings two or more at one time, and the use and application of colors to represent different materials, making in all a valuable work for the experienced draftsman as well as for the student.

Rose.—Mechanical Drawing Self-Taught. By Joshua Rose; 330 engravings, 313 pages, 8vo, cloth. \$4

This work will be found to be thoroughly adapted to the practice of American machinists. It comprises instructions in the selection and preparation of drawing instruments, with elementary instruction in practical mechanical drawing. The illustrations give examples in simple geometry and elementary mechanism, including screw-threads, gear-wheels, mechanical motions, engines and boilers.

Construction and Materials.

Modern House Carpenter's Companion and Builder's Guide. By W. A. Sylvester. 3d edition, enlarged, 45 full-page plates containing 109 illustrations, 210 pages, 12mo, cloth. \$2

This is a well-arranged hand-book for carpenters and builders. It contains rules for getting the lengths and finding the bevels for rafters for pitch, hip and valley roofs; the construction of French and mansard roofs; several forms of trusses and stairs, splayed and circular work, &c.; a table of braces, sizes and weights of window-sash and frames for the same; a table of board, plank and scantling measure; rules for estimating the sizes and capacity of bins for grain, potatoes, coal, &c., also rules for tanks to hold from 5 to 100 gallons; weights and strength of various materials. There is a brief treatise on the use of the slide rule, and there are tables of the diameters, circumferences and areas of circles, rules and examples in simple and compound proportion, square and cube root, mensuration, and the metric system of weights and measures.

Star-Building Made Easy. By F. T. Hodgson. 123 illustrations, 12mo, cloth. \$1.

Problems in hand-railing are not considered to any extent in this book. The author presumes that the reader is a beginner in the art of stair-building, and has treated the subject in the most practical manner by first explaining how to build a stair of the humblest sort, and then leading the workman step by step to the consideration of more complex construction. The book contains descriptions of the art of building the bodies, carriages and cases for all kinds of stairs and steps, together with illustrations showing the manner of laying out stairs, forming treads and risers, building cylinders, preparing strings, and instructions for making carriages for common, platform, dog-legged and winding stairs. An illustrated glossary of terms is added, with designs for newels, balusters, brackets, stair-moldings and sections of hand-rails.

Architects' and Builders' Pocket Companion and Price Book. By Frank Vogdes. Enlarged, revised and corrected. 368 pages, full bound in pocket-book form, \$2; cloth. \$1.50

This work consists of a short and comprehensive epitome of decimals, duodecimals, geometry and mensuration, with tables of United States measures, sizes, weights, strength, &c., of iron, wood, stone and various other materials, quantities of materials in given sizes and dimensions of wood, brick and stone, together with a full and complete bill of prices for carpenters' work. Rules for computing and valuing brick and brick-work, stonework, painting, plastering, &c., are presented.

Rudiments of Practical Bricklaying. By Adam Hammond; illus. by 68 woodcuts, 115 pages, 4 by 7 inches, limp cloth. \$1.50

This is intended as a handbook for apprentices and beginners. It presents the general principles of bricklaying, with illustrations of footings, bonding, &c. A chapter on arches gives the mechanic all necessary instruction with reference to drawing, setting and cutting arches. Pointing, paving and tiles are considered. There is a chapter on practical geometry and mensuration, and one on the mensuration of brickwork. This book was prepared for English students, and all the materials named are described in terms peculiar to the English markets.

Builder's Guide and Estimator's Price Book. By Fred. T. Hodgson, 331 pages, 5 by 7 $\frac{1}{2}$ inches, cloth. \$2

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Plasterers' Manual. By K. Cameron; revised edition, 67 pages, 4 $\frac{1}{2}$ by 6 $\frac{1}{2}$ inches, 10 illustrations, cloth. \$0.75

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Hood.—A Practical Treatise on Warming Buildings by Hot Water, Steam and Hot Air, and on Ventilation. By Charles Hood, F. R. S.; 6th edition, 64 illustrations, 463 pages, 8vo, cloth. \$5

The present is a reprint of the 5th enlarged revised edition of this excellent treatise. The work is divided into two general parts. Part I treats of warming buildings by hot water. Under this head are chapters on the circulation and compression of water and the inclination and level of pipes; on the motive power and velocity of circulation; on the relative sizes of pipes; on temperature, pipes and boilers, durability of material and fuel; on furnaces, their construction and modes of firing, and on forms of hot-water apparatus. Following these is an estimate of the heating surfaces required to warm any description of building, chapters on heating by steam and by hot air and on apparatus for baths and domestic service, together with remarks on the laws and phenomena of heat, and experiments on cooling. Part II considers the various methods of warming and ventilating by the combustion of fuel. The different forms of fireplaces and stoves, the changes produced in atmospheric air by heat, combustion and respiration, and methods of ventilation, receive particular attention in this section. The concluding chapters treat of the theory of gaseous efflux, the chemical constitution of coal, and the combustion of smoke. An appendix to the work includes tables of the expansive force of steam, of the expansion of air and other gases, of the specific gravity and expansion of water, &c.

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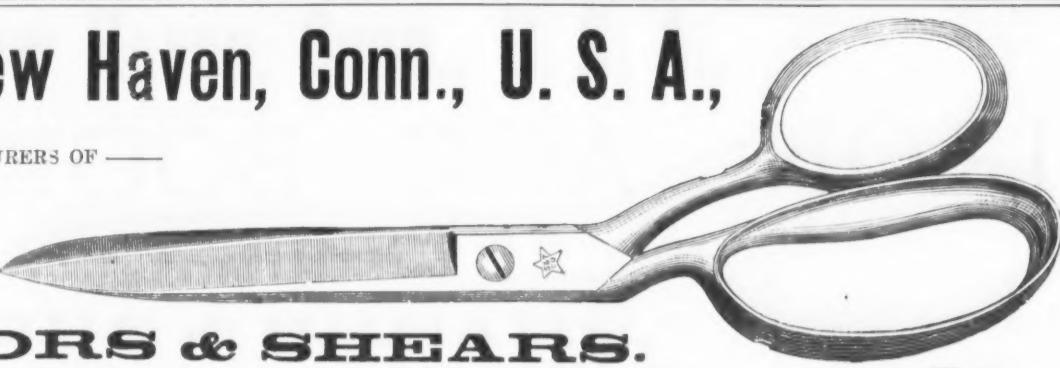
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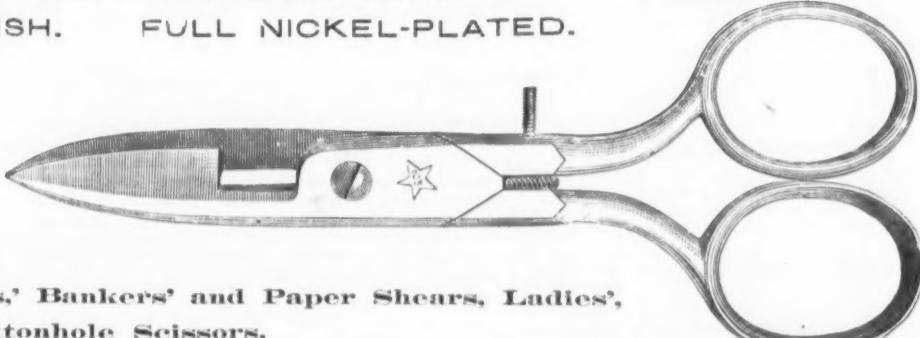
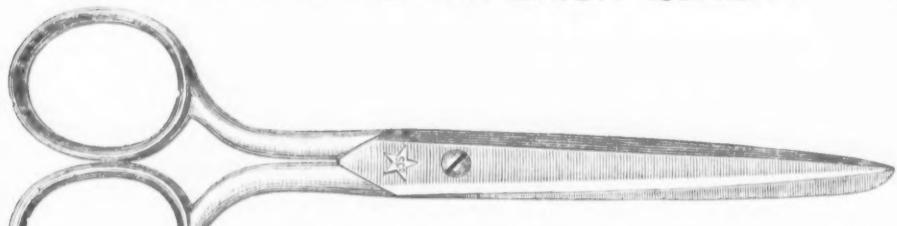
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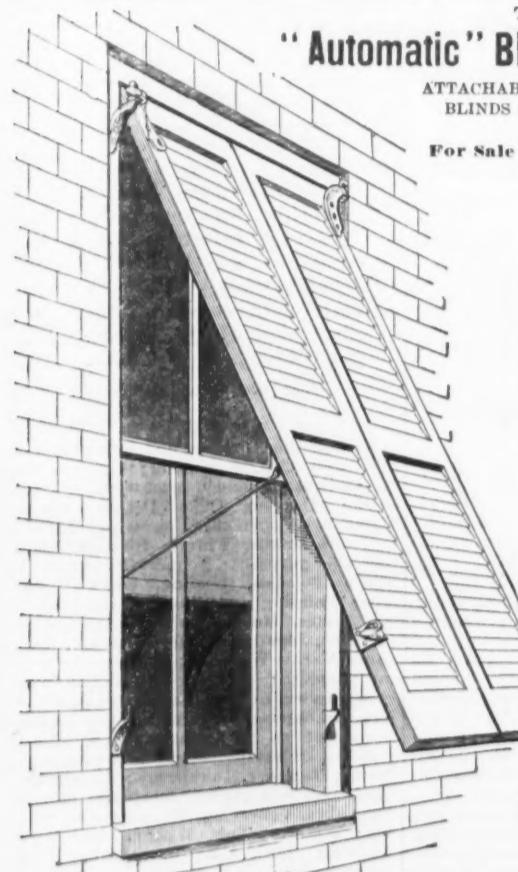


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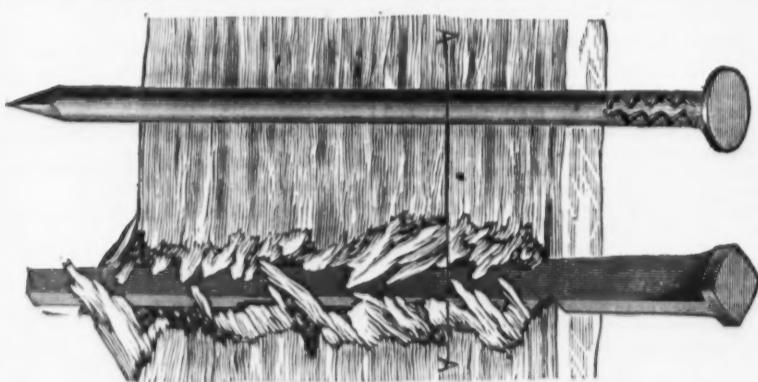
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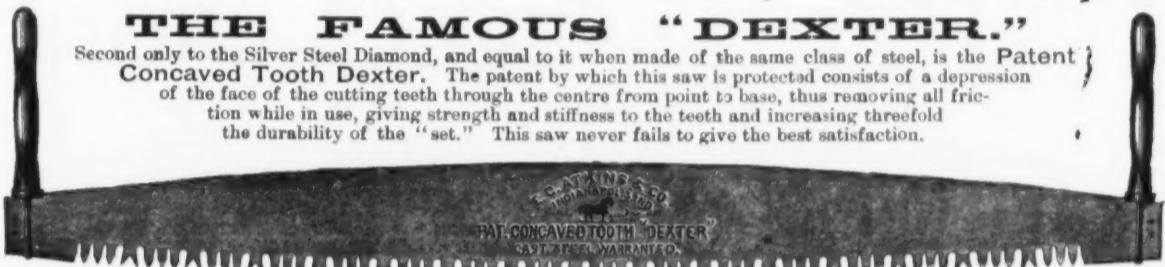
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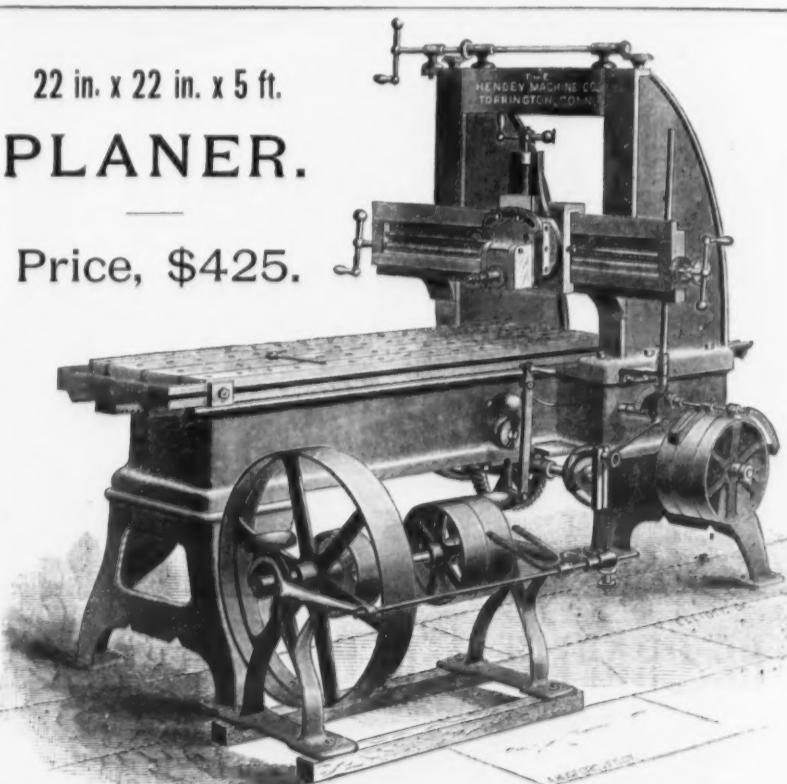
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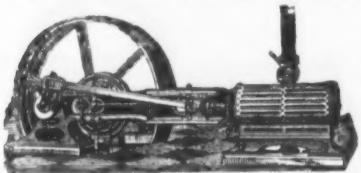
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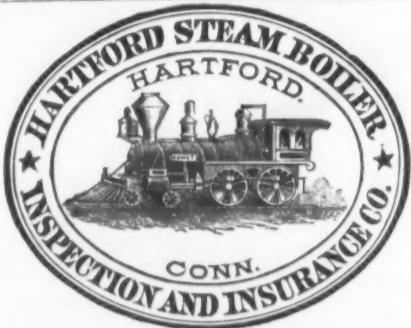


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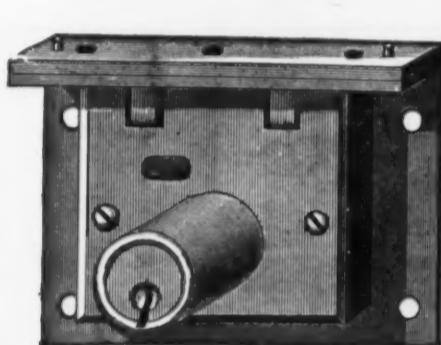
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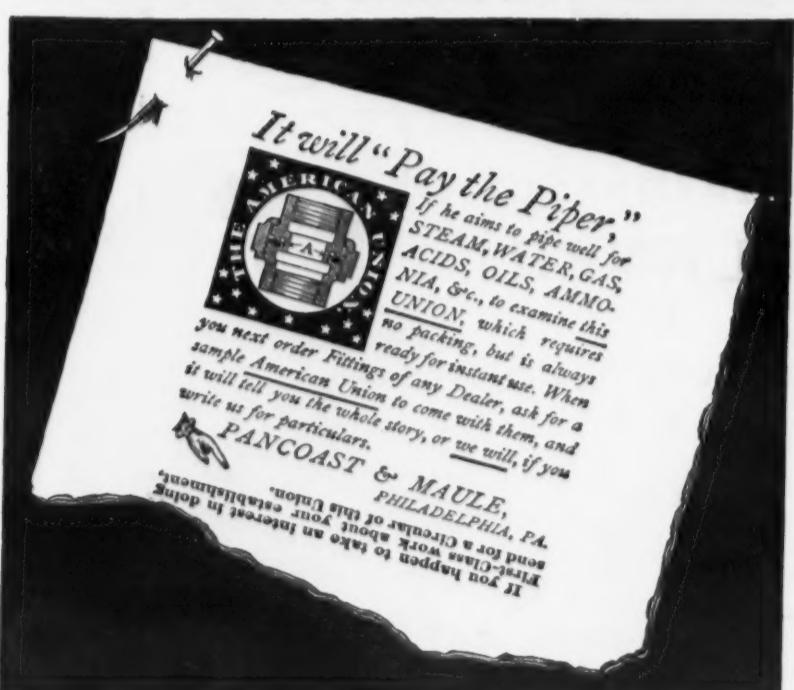
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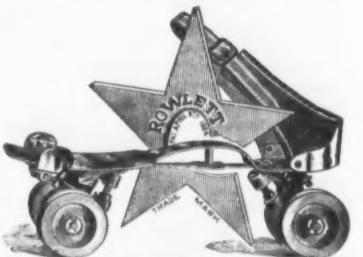
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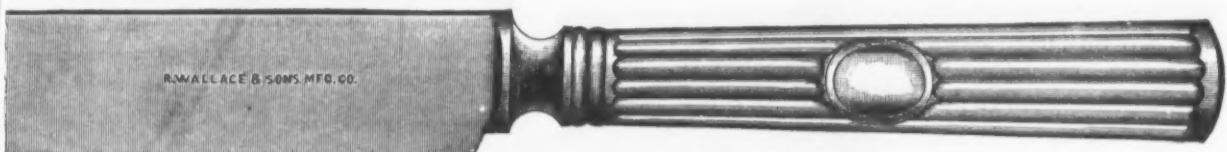
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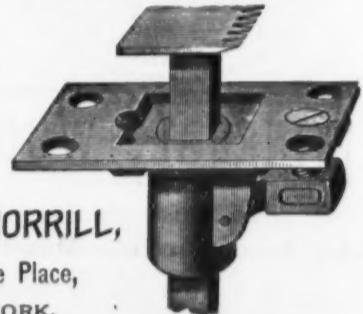
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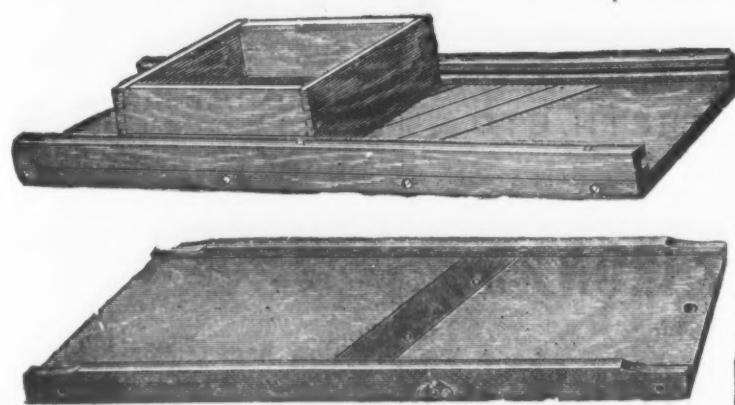
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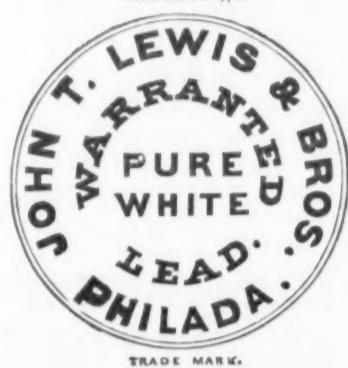
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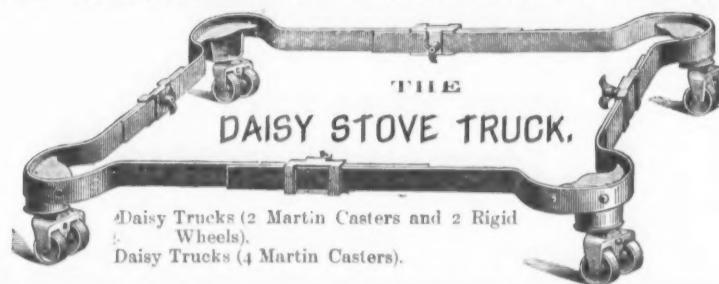
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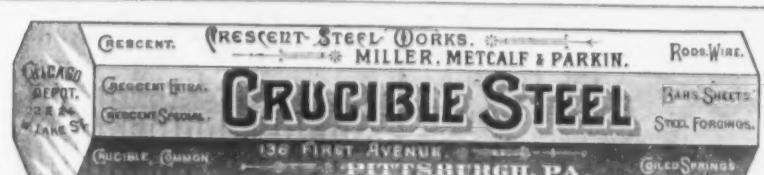
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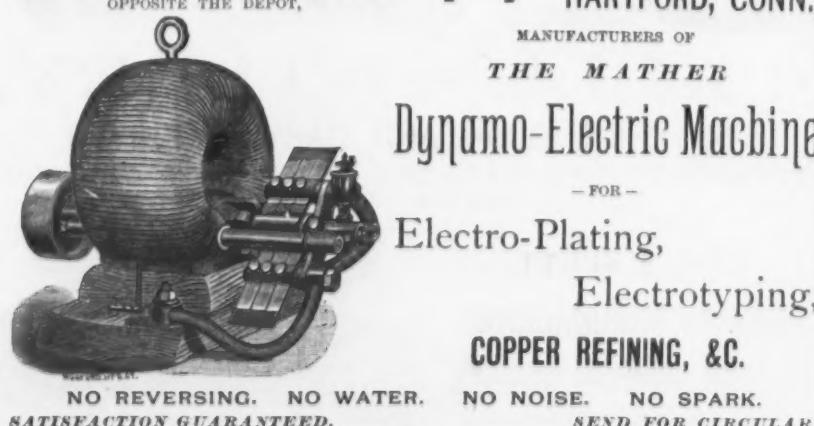
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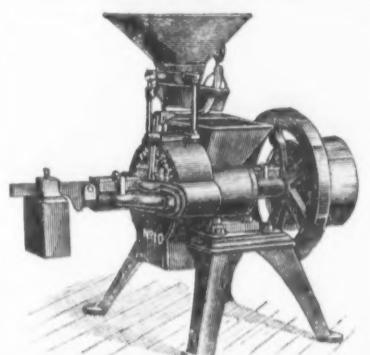
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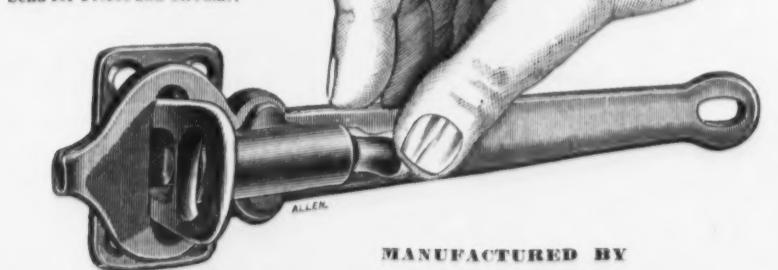
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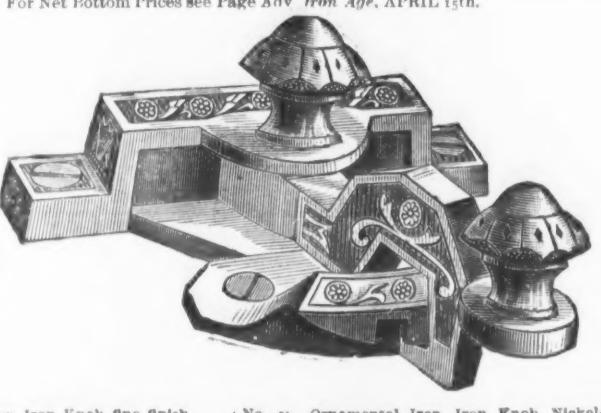
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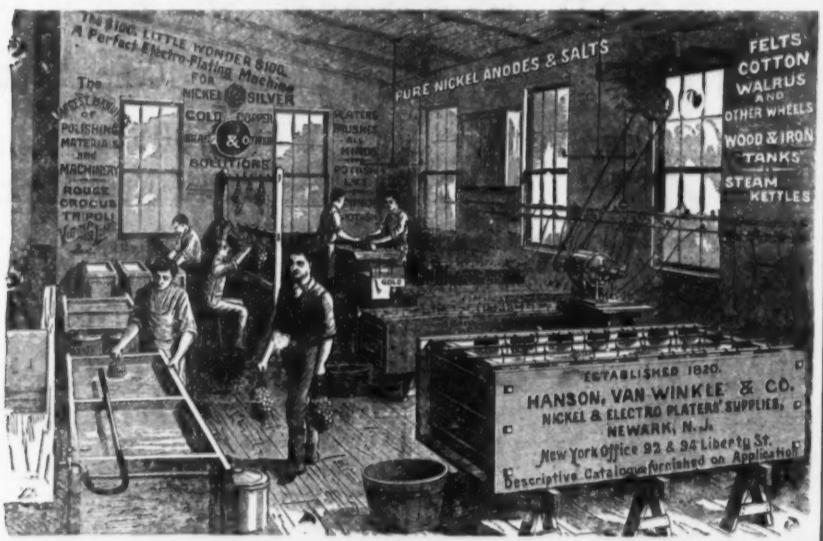


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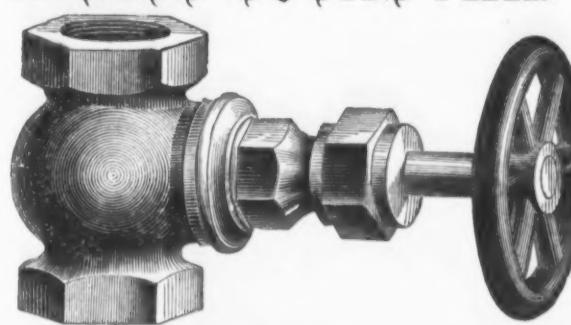
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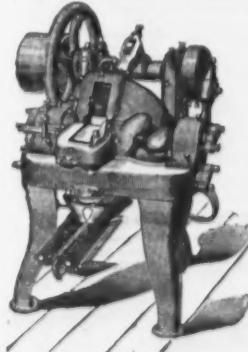
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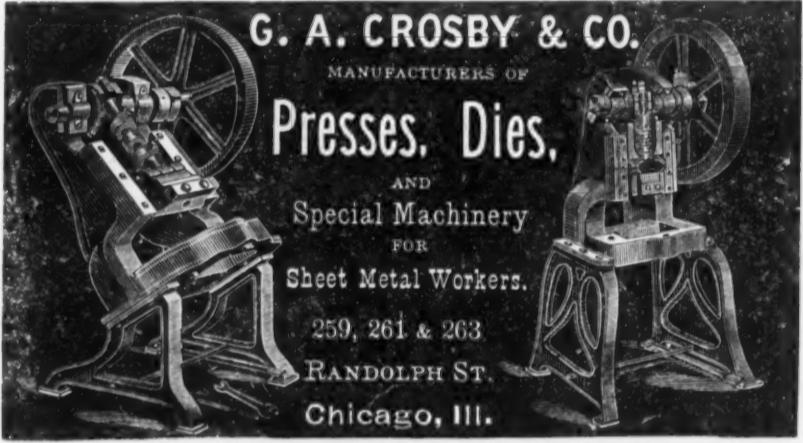
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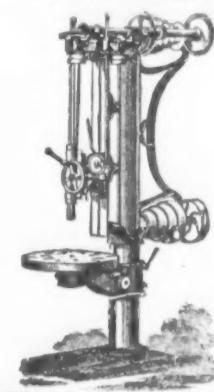
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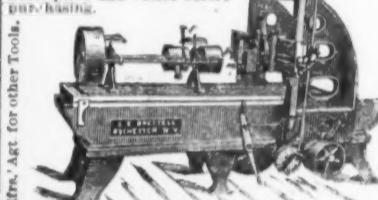
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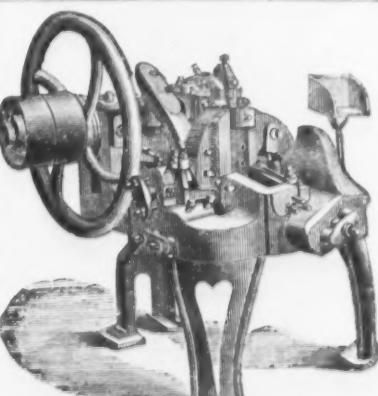
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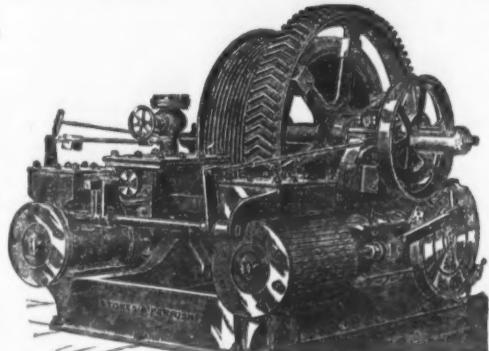
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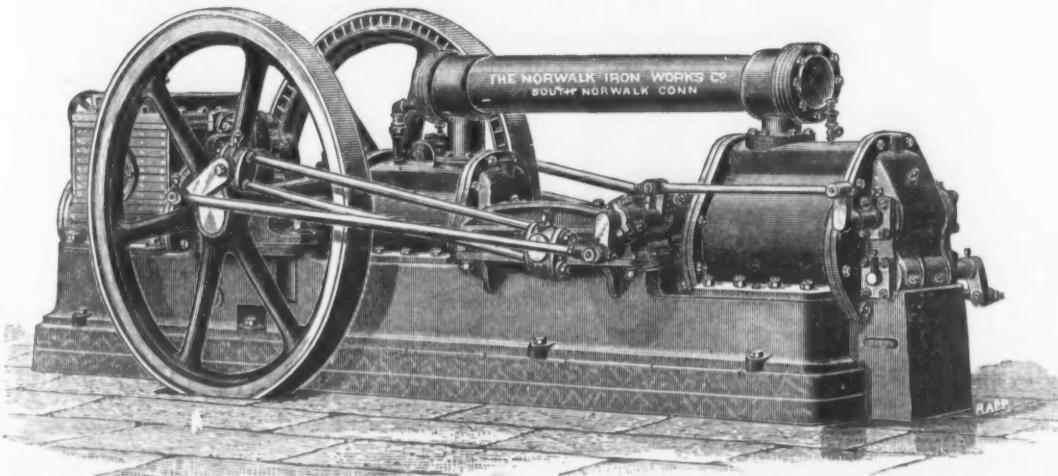


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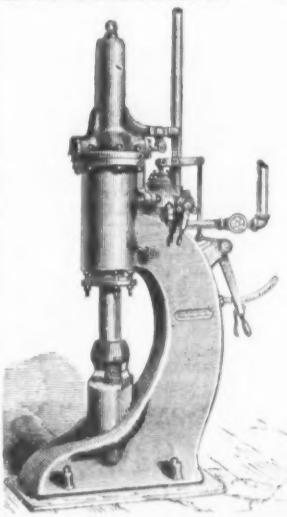
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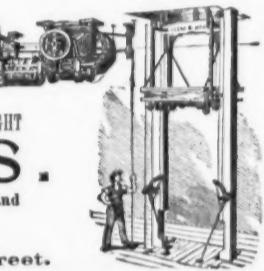
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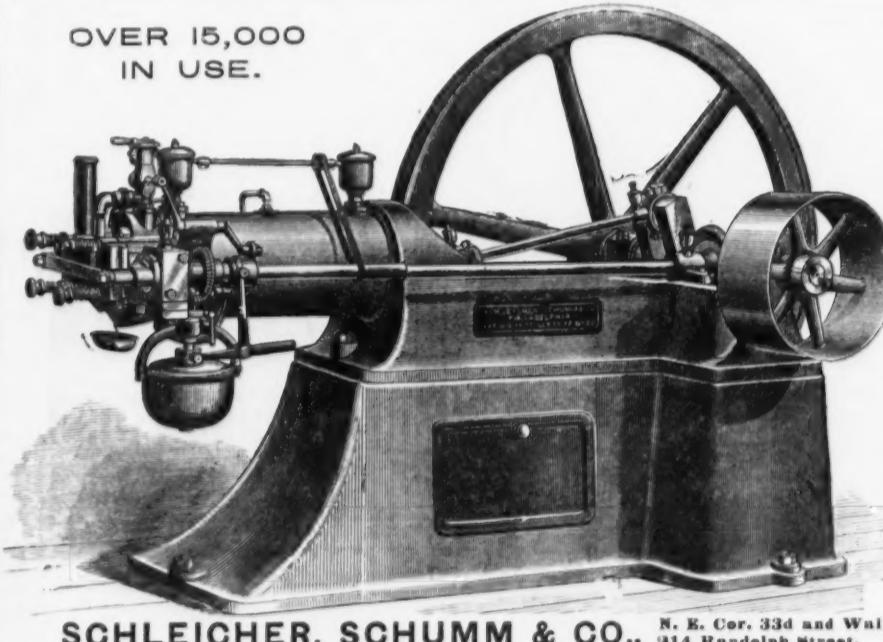
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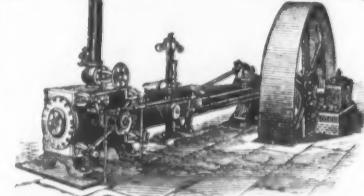
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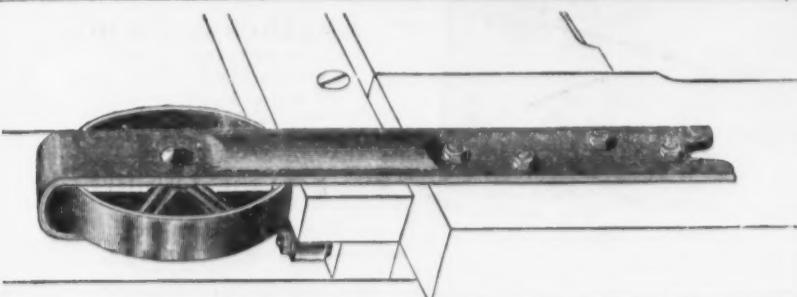
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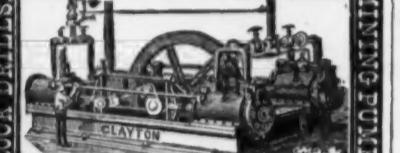
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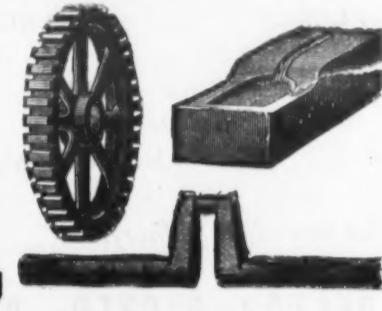
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